



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: SANG MIN LEE

Serial No.: 09/940,210

Group Art Unit: 2674

Title: COMPACT KEYBOARD FOR HANDHELD COMPUTER

Examiner: DUC Q DINH

AMENDED APPELLANT'S BRIEF

This brief is in furtherance of the Notice of Appeal filed in this case on November 30, 2005. This Brief is being filed in response to an office communication dated 6/30/2005.

The brief is transmitted in triplicate as required under 37 C.F.R. §1.192(a)). THIS BRIEF WAS AMENDED IN RESPONSE TO OFFICE COMMUNICATION DATED 1/10/2007. I AM REQUESTED 2 MONTHS EXTENSION.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10

I hereby certify that, on the date shown below, this correspondence is being: Deposited with the United States Postal Service in an envelop addressed to Mail Stop Appeal Brief, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 as express Mail Post Office to Addressee Mailing Label NO. EG 845 30446 VUS

Date: 4/10/07

[Signature]
Signature

I. REAL PARTY INTEREST

The real party in interest in this appeal is the party named in the caption of this brief, **SANG MIN LEE.**

II. RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences. This brief is an amended to the prior filed brief.

III. STATUS OF CLAIMS

Applicant received a first non-final office action in August of 2001. Applicant amended claims in line with a telephone communication with Examiner 8/28/2001. Claim 2 was allowed. Claim 1 was amended with part of the limitation of claim 2 to place the application in a condition for allowance. Claims 4,10, and 16 were amended to correct the spelling of LCD. Claims 19-24 was added to reclaim subject matter in claim 1 for a continuation. As result of the claims status are as follows (See Exhibit 1 in the Appendix of claims):

1. (currently amended)
2. (currently amended)
3. (original)
4. (currently amended)
5. (original)
6. (original)
7. (original)
8. (original)

9. (original)
10. (currently amended)
11. (original)
12. (original)
13. (original)
14. (original)
15. (original)
16. (currently amended)
17. (original)
18. (original)
19. (new)
20. (new)
21. (new)
22. (new)
23. (new)
24. (new)

A year later Applicant received a second non-final office action in December 2004. Applicant amended claims in line a telephone communication with Examiner. Examiner and Applicant agreed that claim 1 was distinguished from the prior art Blandenbergl. However, we discussed how claim 7 and 13 had to be amended to further distinguish the application from the Blandenbergl As result of the claims status were as follows (See Exhibit 2 in the Appendix of claims):

1. (previously presented)

2. (previously presented)
3. (original)
4. (previously presented)
5. (original)
6. (original)
7. (currently amended)
8. (original)
9. (original)
10. (previously presented)
11. (original)
12. (original)
13. (currently amended)
14. (original)
15. (original)
16. (currently amended)
17. (original)
18. (original)
19. (new)
20. (new)
21. (new)
22. (new)
23. (new)
24. (new)

IV. STATUS OF AMENDMENTS

Applicant received a final office action on 6/30/2005. This office action was not in line with examiner and applicant prior telephone conversation. Additionally, this office action raised issues that were never discussed in the telephone conversation. Claim 13 was rejected under 35 USC 112. I reviewed the specifications and drawings and determined there were typographical errors in the specifications. I provided that explanation to the examiner in a telephone conversation. Applicant amended the specifications because there was a mislabeling on the drawings of 746, 742, 741, 745 and 7A. I felt that arrow A in drawing 7A needed to be clarified. There were typographical errors in specifications which were changed accordingly Page 9 lines 9-29 and page 10 lines 1-8. The claims presented with the response to the final office action are presented below (See exhibit 3). The claims were not amended. Only the specification was amended to correct 112 rejection. Applicant reasserted the amendments from the prior office action. (See Exhibit 3).

1. (previously presented)
2. (previously presented)
3. (original)
4. (previously presented)
5. (original)
6. (original)
7. (previously presented)

8. (original)
9. (original)
10. (previously presented)
11. (original)
12. (original)
13. (previously presented)
14. (original)
15. (original)
16. (currently amended)
17. (original)
18. (original)
19. (new)
20. (new)
21. (new)
22. (new)
23. (new)
24. (new)

V. SUMMARY OF CLAIMED SUBJECT MATTER

Referring to FIG 1 –3A, page 4 lines 29-37, and page 5 lines 2-29, a description of independent claim 1 is provided. Because independent claim 19 is a broader claim than claim 1, it is also described in the above listed pages. Independent Claim 1 and 19 discloses a handheld computerized device with an attached compact keyboard. In this embodiment of the present invention, the device consists of a keyboard portion and an electronic portion. The keyboard portion and the electronic housing both have a configuration defined by a top edge, bottom edge, top surface, bottom surface, and a pair

of side edges. In this embodiment of the present invention, the top edge of the keyboard portion is hingedly connected to the top edge of the electronic housing. A keypad overlays the top surface of the keyboard portion and a display means overlays the top surface of the electronic housing. A microprocessor is situated inside the electronic housing and is electrically connected to keyboard the portion. The hinge connection between the keyboard portion and the electronic housing allows the keyboard portion to pivot from a closed position into an operable position. When in a closed position the keypad and display means are enclosed in a cavity formed by the closure of the keyboard portion against the electronic housing. To pivot into an operable position, the keyboard portion is pivoted 360 degrees around the longitudinal axis of the electronic housing such that the bottom surface of the keyboard portion becomes parallel to the bottom surface of the electronic housing.

Referring to FIG. 6, and page 8 lines 22-29, a description of independent claim 7 is provided. Independent Claim 7 discloses another embodiment of a handheld computerized device with an attached compact keyboard. In this embodiment of the present invention, the bottom surface of the keyboard portion is permanently affixed to the bottom surface of the electronic housing. In this embodiment the handheld device is fixed in its operable position. A keypad overlay the top surface of the keyboard portion and a display means overlays the top surface of the electronic housing.

Referring to FIG. 7-7C, and page 9 lines 9-29, and page 10 lines 2-11, a description of claim 13 is provided. Claim 13 discloses another embodiment of a handheld computerized device with an attached compact keyboard. In this embodiment of the present invention, the handheld device consists of a sliding bracket having a pair of guide members integrally coupled to the side edges of the electronic housing. The side edges of the keyboard portion are adapted to slide into the guide members. In this embodiment the handheld device is placed in an operable by sliding the keyboard portion with the bottom surface of the keyboard portion parallel to the bottom surface of the electronic housing.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Applicant is requesting a review of the 103 rejections of claims 1, 2, 19-24, and 7, and 8. Additionally, the 112 rejection of claim 13 needs to be reviewed in this appeal.

VII. ARGUMENT

ISSUE 1: 103 REJECTION OF CLAIM INDEPENDENT CLAIM 1, 2, 7, 8, 19-23.

In my final office action response, Applicant reiterated original response per the telephone interview on December 27, 2004 as follows. In his final office action response, Examiner never discussed FIG. 6C of Brandenburg. Per our telephone conversation, Applicant pointed out the significance of FIG. 6C.

Regarding claim 1, Applicant and Examiner agreed that Applicant's claimed invention could be distinguished from Blandenbergl. Applicant claims:

a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;

Blandenbergl states:

As device 801 transitions to the open state, display portion 803 hingedly pivots relative to body portion 807 as indicated by arrow 809 in FIG. 6B. In the open

state, display screen 815 is adjacent to and visible above thumbboard 805. Fig. 6a shows the closed state and Fig. 6B is still in the closed state to show the transition to FIG. 6C.

As shown in FIG. 6C of Brandenburg, the invention in the prior art keyboard is adjacent to the keyboard in an open state. Brandenburg illustrates in FIG. 6A and 6B that bottom surface of the keyboard and display portion are parallel in a closed state.

Applicant claims the electronic housing having the display and the keyboard portion are parallel in an open state. Thus, the Applicant's invention is distinguished from the prior art. As shown in FIG.'S, 6A, 6B, and 6C, the lower edge of the display is hingedly connected to the top edge of the keyboard housing. As shown in FIG. 1 in the specification, the two top edges are hingedly connected as claimed.

Regarding claim 7, Examiner cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. A factual inquiry whether to combine references must be thorough and searching. A showing of suggestion, teaching or motivation to combine the prior art references is an essential component of an obvious holding. The prior art must suggest a desirability to combine prior art references. (See 277 F3d 1338, 61 USPQ2d 1430 (Fed. Cir 2002)).

Here, examiner noted that Brandenburg does not teach the limitation of the bottom surface being permanently affixed of the keyboard in an operable position. The examiner tried to use Brandenburg to fit the claim limitations of Applicant's invention. However, as noted above Brandenburg does not teach or suggest the configuration as

claimed by the applicant. Brandenburg teaches a pivoting of a display into a normal configuration with the display adjacent to the keyboard in an open state. The device in Brandenburg is not hingedly connected as claimed by the Applicant. The hingedly connection between the two top edges facilitates the transitioning of the applicant's device the open state.

Ni illustrates a keyboard affixed to the backside of a notebook computer or gamebox. Ni is new reference traversed by the examiner. Additionally, the Keyboard in Ni is not Parabolic as claimed by the Applicant.

Ni nor Brandenburg discloses hand grips for supporting the hands while typing on the keyboard when the device is in the open state. In Brandenburg in FIG. 6C, a standard keyboard is shown. Thus hand support means on the side is not required. Label 827 in FIG. 6C designates joysticks. By plain definition joysticks are not used for hand support means. Thus, there is no motivation to combine Ni and Brandenburg. Additionally, it also follows that there is no motivation to combine Makala as well.

Regarding claims 19-24, the above arguments would follow. As explained above claim 19-24 was added to recapture the claim limitation of the original filed application after the first office action. Applicant amended claim 1 to put the application in a condition of allowance.

ISSUE 2: 112 REJECTION OF CLAIM 13

Claim 13 was amended in the final office action to claim an alternative embodiment of claim 1, wherein the invention is slid into an operable position with the

bottom surface of electronic housing (720) and keyboard portion (710) in a parallel position. (See Page10 lines 3-5 and FIG. 7C).

The specifications do more than just mention operable versus closed state. Page 9 lines 9-29 and page 10 lines 1-8 disclose the full process of how the embodiment of claim 13 functions. There are some typographical errors between the FIG.'S 7A-7C and the specifications. The disclosure can be amended to matter that is inherently disclosed by the original application. (*See In re Smyte, 480 F.2d 1376, 178 USPQ 279 (C.C.P.A)*) As a result, applicant has amended the specifications to be in line with the drawings which are part of the original disclosure. Examiner alleges that the specifications fail to convey to one skilled in the art. Applicant has amended FIG 7A and 7B with labels in line with FIG 7 and FIG. 7C. Applicant provided original drawing of FIG. 7C with response to Office Action for clarification. The specification was amended as follows (Please note that examiner and applicant discussed these changes in a telephone conversation; because these amendments are typographical they could have been taken care of before final office action response. This was never mentioned to me prior to final office action):

- *Labels (746,747) was replaced with 736, 737 to show rib designations. Numerals 746 and 747 were designated as ribs earlier in the application. This is an obvious error that can be amended.*
- *Labels 741 and 742 were changed because their designations are reversed in the drawings. This is an obvious error that can be amended.*
- *More designations were added to FIG. 7A and 7B for clarification and to bring them in line with FIG. 7 and 7C. These designations are taken*

directly from the drawings 7 and 7C which were disclosed in the original disclosure.

- *Numeral 765 was changed to 745. Numeral 745 is depicted as bottom surface of the electronic housing in the specifications and drawings. This is an obvious error for amendment.*
- *A description of 7A and 7B was added for clarification for examiner. 7B was changed to 7A. 7A is the closed state. This is an obvious error that can be amended in view of the drawings.*
- *As shown in FIG. 7A, in the closed state the keypad (125) faces the bottom surface of the electronic housing which is also stated in the specifications on Page 10, "After the user is finished using device (700), the keyboard portion (710) is slid into guide members (735, 737) with the keypad (725) facing the bottom surface (~~765~~) (745) of electronic housing (720)" As shown in the operable state in FIG. 7B, keypad 125 does not face the bottom surface of the electronic housing. However, Applicant can change wording to state a parallel configuration which is also depicted in FIG. 7A if required by the examiner.*

Drawings are considered part of the specifications. (*See Was-Cath, Inc v. Mahurkar*, 935 F2d 1555, 19 USPQ2d 1111, 1118 (Fed. Cir. 1991)). Fig.'s 7A-7C illustrates the configuration of operable and closed state of this embodiment of the present invention. The language of claim 13 comes directly from the specifications in conjunction with the drawings. It is not clear what examiner means by the specification do not reasonably convey to one skilled in the art. Clarification is required because the

drawings are clear. The description does not require literal support for the claimed invention. The disclosure should convey the concept that is claimed. (*See Ex Parte Parks 30 USPQ2d 1234, 1246-27 (B.P.A.I 1993)*)

Here, the drawings do provide the concept of the claimed invention. The changes to the specifications to bring them in line with drawings are appropriate changes.

VIII. APPENDIX A OF CLAIMS INVOLVED IN THIS APPEAL

1. (Previously Presented) A handheld computerized device comprising:
 - a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - a means for displaying data overlaying the top surface of the electronic housing;
 - and
 - a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby data entered at the keypad is transmitted to the processor and displayed by the display means;
 - and

a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;

2. (Previously Presented) The device recited in Claim 1, wherein the keypad further comprises:
 - the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
 - the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
3. (original) The device recited in Claim 1, wherein the display means further comprises:
 - a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
 - each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
4. (Previously Presented) The device recited in Claim 3 wherein the display area is a Liquid Crystal Display (LCD).
5. (original) The device recited in Claim 3, wherein the bottom strip and each side strip of the front panel further comprises:
 - a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
6. (original) The device recited in Claim 1, further comprising:
 - a pressure sensitive writing means for allowing data to be inputted via handwriting; and
 - the pressure sensitive writing means overlapping the bottom edge of the display

area.

7. (currently amended) A handheld computerized device comprising:
 - a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard portion in an operable position;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - a means for displaying data overlaying the top surface of the electronic housing;
 - and
 - a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.
8. (original) The device recited in Claim 7, wherein the keypad further comprises:
 - a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
 - the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
 - the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
 - the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
9. (original) The device recited in Claim 7, wherein the display means further comprises:
 - a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a

- bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each
corresponding strip of the display area.
10. (Previously Presented) The device recited in Claim 9 wherein the display area is a
Liquid Crystal Display (LCD).
11. (original) The device recited in Claim 10, wherein the bottom strip and each side strip
of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character
signal upon depression thereof; and
a means for electrically connecting the plurality of additional alphanumeric keys
to the processor whereby each generated character signal is transmitted to the
processor.
12. (original) The device recited in Claim 7, further comprising:
a pressure sensitive writing means for allowing data to be inputted via
handwriting; and
the pressure sensitive writing means overlapping the bottom edge of the display
area.
13. (currently amended) A handheld computerized device comprising:
a sliding bracket having a pair of guide members;
a keyboard portion having a support base and a keypad, the support base
including a top surface, a bottom surface, a rear edge, a front edge, and a pair of
side edges, the pair of side edges being adapted to slide into the pair of guide
members in an operable state or in a closed state, the keypad overlaying the top
surface of the support base;
an electronic housing having a configuration with a top surface, a bottom surface,
a rear edge, a front edge, and a pair of side edges, the pair of side edges being
integrally coupled to the pair of guide members;
a pair of hand support means being securely attached at an ergonomic position
along each side edge of the electronic housing, whereby a user's left hand or right
hand or both hands are supported while the user is typing on the keypad;
in the operable state, the side edges of the support base are adapted to slide into

the guide members such that the bottom surface of the support base and the bottom surface of the electronic housing are parallel to each other;
in the closed state, the side edges of the support base are adapted to slide into the guide members such that the keypad faces the top surface of the electronic housing;
a means for displaying data overlaying the top surface of the electronic housing;
and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.

14. (original) The device recited in Claim 13, wherein the keypad further comprises:
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand;
15. (original) The device recited in Claim 13, wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
16. (Previously Presented) The device recited in Claim 15 wherein the display area is a Liquid Crystal Display (LCD).
17. (original) The device recited in Claim 15, wherein the bottom strip and each side strip

of the front panel further comprises:

- a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
- a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.

18.(original) The device recited in Claim 13, further comprising:

- a pressure sensitive writing means for allowing data to be inputted via handwriting; and
- the pressure sensitive writing means overlapping the bottom edge of the display area.

19. (Previously Presented) A handheld computerized device comprising:

- a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
- an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;
- a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad.

20. (Previously Presented): The device recited in Claim 19, wherein the keypad further comprises:

- a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas,
- the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;

the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and

the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.

21. (Previously Presented) The device recited in Claim 19 wherein the display means further comprises:

a display area defined by a top edge, bottom edge, and a pair of side edges;

a front panel surrounding the display area and being defined by a top strip, a

bottom strip, securely attached to each corresponding strip of the display area.

22. (Previously Presented): The device recited in Claim 21 wherein the display area is a Liquid Crystal Display (LCD).

23. (Previously Presented): The device recited in Claim 21 wherein the bottom strip and each side strip of the front panel further comprises:

a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof;

a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.

24. (Previously Presented) The device recited in Claim 19 further comprising :

a pressure sensitive writing means for allowing data to be inputted via handwriting; and

the pressure sensitive writing means overlapping the bottom edge of the display area.

IX. EVIDENCE APPENDIX B

The below documents are not affidavits. They are part of the record and are provided for convenience of the board to understand the issues at hand. The whole record needs to be evaluated. The applicant is providing the documents for review. There are no related appeals to this case.

Exhibit 1 – Response to the First non-final Office Action amendment with claims

(This document is part of the record. This document was filed in response to the first office action. This document was filed 8/13/2003.)

Exhibit 2- Response to the Second non-final Office Action Amendment with Claims

(This document is part of the record. This document was filed 12/29/2004)

Exhibit 3- Final Office Action Response with Claims

(This document is part of the record. The examiner did not enter into the record claim 13. However, the amendments are at issue in this whole appeal)

Exhibit 4 – Brandenburg Patent with drawings.

(this patent at issue in 12/29/2004 office action sent by the examiner.)

(This document is part of the record. This patent was used by examiner to state obviousness of the applicant's patent. My arguments above discuss this issue)

Exhibit 5 first office Action sent by examiner

Exhibit 6—final office Action sent by examiner

Exh. 6. + 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : SANG MIN LEE

Serial No.: 09/940,210

Filed: 08/28/2001

Group Art Unit: 2674

Title: COMPACT KEYBOARD FOR HANDHELD COMPUTER

Examiner: Francis Nguyen

AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Honorable Sir:

This amendment is filed in response to the office action dated August 28, 2001.

IN THIS CLAIMS

1. (currently amended): A handheld computerized device comprising:

a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base; an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;

a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands

are supported while the user is typing on the keypad;
a means for displaying data overlaying the top surface of the electronic housing; and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby data entered at the keypad is transmitted to the processor and displayed by the display means[.];
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;

2. (currently amended): The device recited in Claim 1, wherein the keypad further comprises:
[a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;]
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
3. (original): The device recited in Claim 1, wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
4. (currently amended): The device recited in Claim 3 wherein the display area is a Liquid [Crystals] Crystal Display (LCD).
5. (original): The device recited in Claim 3, wherein the bottom strip and each side strip of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and

a means for electrically connecting the plurality of alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.

6. (original): The device recited in Claim 1, further comprising:

a pressure sensitive writing means for allowing data to be inputted via handwriting; and
the pressure sensitive writing means overlapping the bottom edge of the display area.

7. (original): A handheld computerized device comprising:

a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;

an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard portion;

a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;

a means for displaying data overlaying the top surface of the electronic housing; and

a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.

8. (original): The device recited in Claim 7, wherein the keypad further comprises:

a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;

the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;

the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and

the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.

9. (original): The device recited in Claim 7, wherein the display means further comprises:

a display area defined by a top edge, bottom edge, and a pair of side edges;

a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.

10. (currently amended): The device recited in Claim 9 wherein the display area is a Liquid [Crystals] Crystal Display (LCD).
11. (original): The device recited in Claim 10, wherein the bottom strip and each side strip of the front panel further comprises:
 - a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
12. (original): The device recited in Claim 7, further comprising:
 - a pressure sensitive writing means for allowing data to be inputted via handwriting; and
 - the pressure sensitive writing means overlapping the bottom edge of the display area.
13. (original): A handheld computerized device comprising:
 - a sliding bracket having a pair of guide members;
 - a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being adapted to slide into the pair of guide members, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being integrally coupled to the pair of guide members;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - a means for displaying data overlaying the top surface of the electronic housing; and
 - a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.

14. (original): The device recited in Claim 13, wherein the keypad further comprises:
- a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
 - the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
 - the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
 - the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand;
15. (original): The device recited in Claim 13, wherein the display means further comprises:
- a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
 - each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
16. (currently amended): The device recited in Claim 15 wherein the display area is a Liquid [Crystals] Crystal Display (LCD).
17. (original): The device recited in Claim 15, wherein the bottom strip and each side strip of the front panel further comprises:
- a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
18. (original): The device recited in Claim 13, further comprising:
- a pressure sensitive writing means for allowing data to be inputted via handwriting; and
 - the pressure sensitive writing means overlapping the bottom edge of the display area.
19. (new): A handheld computerized device comprising:
- a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;

an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;
a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad; and.

20. (new): The device recited in Claim 19, wherein the keypad further comprises:

a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.

21. (new): The device recited in Claim 14, wherein the display means further comprises:

a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, securely attached to each corresponding strip of the display area.

22. (new): The device recited in Claim 3, wherein the display area is a Liquid Crystal Display (LCD).

23. (new): The device recited in Claim 3, wherein the bottom strip and each side strip of the front panel further comprises:

a plurality of additional alphanumeric keys each adapted to generate a character signal

upon depression thereof; and

a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.

24. (new): The device recited in Claim 1, further comprising:

a pressure sensitive writing means for allowing data to be inputted via handwriting; and
the pressure sensitive writing means overlapping the bottom edge of the display area.

REMARKS

AMENDMENTS

1. REGARDING CLAIMS 4, 10, and 16

The word **CRYSTALS** is misspelled. The correct interpretation of **LCD** is Liquid Crystal Display. Each claim was corrected accordingly.

2. REGARDING CLAIMS 1 AND 2

Per our telephone interview, in order to place claims 1-6 in a condition for allowance, the first two limitations of claim 2 was moved up into claim 1. The last two claim limitations were remained in claim 2.

ARGUMENTS

3. REGARDING ORIGINAL CLAIM 1

Genest discloses a latch and a hook to fasten the two portions of the handheld device together. Fastening means is normally defined as some type of structure that holds two separate structures together such as screw or latch and a hook. The applicant's claim invention discloses a hand support means for supporting the left and right hand while typing on the keypad. When the word "whereby" and its accompanying phrase set forth a structural limitation for the invention recited in the claim, the word "whereby" and the accompanying phrase will be considered a positive limitation of the claim and thereby limit the claim accordingly. (See *Scheinman v Zalkind*, 112 F.2d 1017, 1019, 46 USPQ 141, 143 (C.C.P.A 1940)). The Genest disclosed fastening means does not provide a structure to for hand support means. Your fingers are required to connect and dislodge the latch and hook. However, technically the fastener does not provide hand support. The applicant describes hand support means as a structure required to support the hands during typing. (See Page 8 Lines 23-29 and Page 9 Lines 1-5 in the specifications) The Genest disclosed fastening means is not structurally or functionally equivalent to the disclosed hand support means. Since the Genest disclosed fastening means is not an

equivalent to the applicant's disclosed hand support means structure in the specification, it cannot provide a suggestion or motivation to utilize Genest's latch and hook as a hand support means and achieved the claimed invention. Therefore, in order to reclaim the original claims 1-6 based upon the argument above claims 19-24 are added.

4. REGARDING CLAIM 7

Genest discloses a handheld device with a first portion having a display screen operably connected onto its inner surface and a second portion having a keyboard operably connected onto its inner surface. The first and second portion are hingedly connected such that in an opened position the first and second portion are pivoted to lie adjacent to each other and in a closed position the inner surfaces of each portion are pivoted to face each other. A fastening means, a latch and hook, is disclosed which secures the first and second portion in a closed position.

The claimed invention describes a handheld device with the bottom surfaces of the first and second portion securely attached together. Hand support means are described to support the hands while typing on the keypad.

In order to establish a prima facie case of obviousness the resulting combination or modification must teach or suggest the claimed invention. (See *In re Wright*, 848 F. 2d 1216, 6 USPQ 2d 1959,1962 (Fed. Cir. 1988)). It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. The court has previously stated that "one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (See *In re Fritch*, 972 F. 2d 1260, 23 USPQ 2d 1780,1784 (Fed. Cir. 1992)). Here, Genest does not provide a suggestion or motivation to have multiple configurations to practice its disclosed invention. The *Levengood* decision teaches that an obvious rejection cannot be predicated on the fact that one skilled in the art would have the capabilities to arrive at the claimed invention. (See *Ex parte Levengood*, 28 USPQ 2d 1300, (Bd. Pat. App. & Inter. 1993)). The *Lindell* decision teaches that the Examiner may not use as an element of the obvious rejection that one skilled in the art would have arrived at the invention by trying different alternative structures. (See *In re*

Lindell, 385 F. 2d 453, 155 USPQ 521 (C.C.P.A. 1967)). Here, Genest teaches pivoting the first and second portion between an opened and closed position. Genest does not teach or suggest an alternative configuration of affixing the bottom surfaces of the two portions together. Thus, one skilled in the art would have to provide the suggestion of an alternative configuration to obtain the applicant's claimed invention. This argument is impermissible based upon the *Levengood* and *Lindell* decision.

The suggestion to combine the references must not require substantial reconstruction or design of the references to arrive at the claimed invention. (See *In re Ratti*, 270 F. 2d 810, 123 USPQ 349,1784 (C.C.P.A. 1959)). Here, Genest will have to be significantly redesigned and restructured to obtain the applicant's claimed invention. Furthermore, the alternative configuration of the applicant's claimed invention would render the Genest invention inoperable. It is not generally enough that the prior art suggest the combination recited in the claims; there must also be some reasonable expectation of success of the suggested combination. (See *In re Dow Chem. Co.* 837 F. 2d 469, 473 USPQ 2d 1529,1531 (Fed. Cir. 1988)).

Here, Genest teaches away from the applicant's claimed invention. In Genest the first and second portion are pivoted into a closed position protecting the display screen and keypad. Then, the fastening means is utilized to secure the two portions in place and thereby protecting the display screen and keypad. With the applicant's claimed invention the bottom surfaces are secured into an open position by affixing the two bottom surfaces.

Genest discloses a latch and a hook to fasten the two portions of the handheld device together. Fastening means is normally defined as some type of structure that holds two separate structures together such as screw or latch and a hook. The applicant's claim invention discloses a hand support means for supporting the left and right hands while typing on the keypad. When the word "whereby" and its accompanying phrase set forth a structural limitation for the invention recited in the claim, the word "whereby" and the accompanying phrase will be considered a positive limitation of the claim and thereby limit the claim accordingly. (See *Scheinman v Zalkind*, 112 F.2d 1017, 1019, 46 USPQ 141, 143 (C.C.P.A 1940)). The Genest disclosed fastening means does not provide a structure to for hand support

means. Your fingers are required to connect and dislodge the latch and hook. However, technically the fastener does not provide hand support. The applicant describes hand support means as a structure required to support the hands during typing. (See Page 8 Lines 23-29 and Page 9 Lines 1-5 in the specifications) The Genest disclosed fastening means is not structurally or functionally equivalent to the disclosed hand support means in the specification. (See 35 USC §112 paragraph 6) Since the Genest disclosed fastening means is not an equivalent to the applicant's disclosed hand support means structure in the specification, it cannot provide a suggestion or motivation to utilize Genest's latch and hook as a hand support means and achieve the claimed invention.

5. REGARDING CLAIM 13

Genest discloses a handheld device with a first portion having a display screen operably connected onto its inner surface and a second portion having a keyboard operably connected onto its inner surface. The first and second portion are hingedly connected such that in an opened position the first and second portion are pivoted to lie adjacent to each other and in a closed position the inner surfaces of each portion are pivoted to face each other. A fastening means, a latch and hook, is disclosed which secures the first and second portion in a closed position. Allegeyer discloses sliding members attached to a disk. Allegeyer does not teach or suggest in a broad sense utilizing guide members on a handheld computer device.

The claimed invention describes a handheld device with a pair of sliding guide members attached to each side edge of the first and second portion. The pair of guide members is utilized to secure the bottom surfaces of the first and second portion in a parallel position. Hand support means are described to support the hands while typing on the keypad.

In order to establish a prima facie case of obviousness the resulting combination or modification must teach or suggest the claimed invention. (See *In re Wright*, 848 F. 2d 1216, 6 USPQ 2d 1959,1962 (Fed. Cir. 1988)). It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This

court has previously stated that “one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. (See *In re Fritch*, 972 F. 2d 1260, 23 USPQ 2d 1780,1784 (Fed. Cir. 1992)). Here, Genest does not provide a suggestion or motivation to have multiple configurations to practice its disclosed invention. The Levengood decision teaches that an obvious rejection cannot be predicated on the fact that one skilled in the art would have the capabilities to arrive at the claimed invention. (See *Ex parte Levengood*, 28 USPQ 2d 1300, (Bd. Pat. App. & Inter. 1993)). The Lindell decision teaches that the Examiner may not use as an element of the obvious rejection that one skilled in the art would have arrived at the invention by trying different alternative structures. (See *In re Lindell*, 385 F. 2d 453, 155 USPQ 521 (C.C.P.A. 1967)). Here, Genest teaches pivoting the first and second portion between an opened and closed position. Genest does not teach or suggest an alternative configuration utilizing guide members to secure the bottom surfaces of the two portions together. Thus, one skilled in the art would have to provide the suggestion of an alternative configuration to obtain the applicant’s claimed invention. This argument is impermissible based upon the Levengood and Lindell decision.

The suggestion to combine the references must not require substantial reconstruction or design of the references to arrive at the claimed invention. (See *In re Ratti*, 270 F. 2d 810, 123 USPQ 349, 1784 (C.C.P.A. 1959)). Here, Genest will have to be significantly redesigned and restructured to obtain the applicant’s claimed invention.

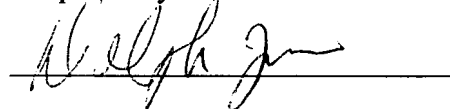
Here, Genest teaches away from the applicant’s claimed invention. In Genest, the first and second portion are pivoted into a closed position protecting the display screen and keypad. Then, the fastening means is utilized to secure the two portions in place and thereby protecting the display screen and keypad. With the applicant’s claimed invention the bottom surfaces are secured into an open position by guide members attached to the side edges of each portion of the handheld device.

Genest discloses a latch and a hook to fasten the two portions of the handheld device together. Fastening means is normally defined as some type of structure that holds two separate structures together such as screw or latch and a hook. The

applicant's claim invention discloses a hand support means for supporting the left and right hand while typing on the keypad. When the word "whereby" and its accompanying phrase set forth a structural limitation for the invention recited in the claim, the word "whereby" and the accompanying phrase will be considered a positive limitation of the claim and thereby limit the claim accordingly. (See *Scheinman v Zalkind*, 112 F.2d 1017, 1019, 46 USPQ 141, 143 (C.C.P.A 1940)). The Genest disclosed fastening means does not provide a structure to for hand support means. Your fingers are required to connect and dislodge the latch and hook. However, technically the fastener does not provide hand support. The applicant describes hand support means as a structure required to support the hands during typing. (See Page 8 Lines 23-29 and Page 9 Lines 1-5 in the specifications) The Genest disclosed fastening means is not structurally or functionally equivalent to the disclosed hand support means. Since the Genest disclosed fastening means is not an equivalent to the applicant's disclosed hand support means structure in the specification, it cannot provide a suggestion or motivation to utilize Genest's latch and hook as a hand support means and achieved the claimed invention.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims and/or drawing, then it is respectfully asked that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance. Alternatively should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned.

Respectfully submitted:

A handwritten signature in dark ink, appearing to read "Delphine M. James", is written over a horizontal line.

Delphine M. James

Registration No. 45,960

Delphine James, Attorney At Law

2656 South Loop West #170

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(713) 661-4144

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CERTIFICATE OF MAILING

I, **Delphine James**, hereby certify that the foregoing **Amendment** is being deposited on 08/18/03 with the United States Postal Service as U.S. Mail, Express mail, in an envelope addressed to:

Commissioner of Patents

Patent Application

Washington DC 20231

Additionally, the foregoing Amendment is being faxed to 703-746-5850.

Express Mail Receipt No. _____.

By: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: SANG MIN LEE

Serial No.: 09/940,210

Group Art Unit: 2674

Title: COMPACT KEYBOARD FOR HANDHELD COMPUTER

Examiner: DUC Q DINH

AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Honorable Sir:

This amendment is filed in response to the office action dated 9/2/2004.

IN THE CLAIMS

1. (original) A handheld computerized device comprising:
 - a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or

- both hands are supported while the user is typing on the keypad;
a means for displaying data overlaying the top surface of the electronic housing; and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby data entered at the keypad is transmitted to the processor and displayed by the display means.
2. (original) The device recited in Claim 1, wherein the keypad further comprises:
 - a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
 - the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
 - the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
 - the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
 3. (original) The device recited in Claim 1, wherein the display means further comprises:
 - a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
 - each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
 4. (original) The device recited in Claim 3 wherein the display area is a Liquid Crystals Display (LCD).
 5. (original) The device recited in Claim 3, wherein the bottom strip and each side strip of the front panel further comprises:
 - a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
 6. (original) The device recited in Claim 1, further comprising:
 - a pressure sensitive writing means for allowing data to be inputted via handwriting;

and

the pressure sensitive writing means overlapping the bottom edge of the display area.

7. (currently amended) A handheld computerized device comprising:
- a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard portion in an operable position;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - a means for displaying data overlaying the top surface of the electronic housing; and
 - a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.
8. (original) The device recited in Claim 7, wherein the keypad further comprises:
- a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
 - the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
 - the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
 - the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
9. (original) The device recited in Claim 7, wherein the display means further comprises:
- a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and

each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.

10. (original) The device recited in Claim 9 wherein the display area is a Liquid Crystals Display (LCD).
11. (original) The device recited in Claim 10, wherein the bottom strip and each side strip of the front panel further comprises:
- a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
12. (original) The device recited in Claim 7, further comprising:
- a pressure sensitive writing means for allowing data to be inputted via handwriting;
 - and
 - the pressure sensitive writing means overlapping the bottom edge of the display area.
13. (currently amended) A handheld computerized device comprising:
- a sliding bracket having a pair of guide members;
 - a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being adapted to slide into the pair of guide members in an operable state or in a closed state, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being integrally coupled to the pair of guide members;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - in the operable state, the side edges of the support base are adapted to slide into the guide members such that the bottom surface of the support base and the bottom surface of the electronic housing are parallel to each other;
 - in the closed state, the side edges of the support base are adapted to slide into the guide members such that the keypad faces the top surface of the electronic housing;

Miller

a means for displaying data overlaying the top surface of the electronic housing; and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.

14. (original) The device recited in Claim 13, wherein the keypad further comprises:
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand;
15. (original) The device recited in Claim 13, wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
16. (original) The device recited in Claim 15 wherein the display area is a Liquid Crystals Display (LCD).
17. (original) The device recited in Claim 15, wherein the bottom strip and each side strip of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
18. (original) The device recited in Claim 13, further comprising:
a pressure sensitive writing means for allowing data to be inputted via handwriting;
and

the pressure sensitive writing means overlapping the bottom edge of the display area.

ARGUMENTS

Per our telephone interview on December 27, 2004, I am filing this response.

Regarding claim 1, we agreed that Applicant's claimed invention could be distinguished from Blandenberg. Applicant claims:

a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;

an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;

Blandenberg states:

As device 801 transitions to the open state, display portion 803 hingedly pivots relative to body portion 807 as indicated by arrow 809 in FIG. 6B. In the open state, display screen 815 display screen 8154 is adjacent to and visible above thumbboard 805.

As shown in FIG. 6C which illustrates the open state of the Blandenburg device, the display is adjacent to the keyboard. The prior illustrates in FIG. 6A and 6B that bottom surface of the keyboard and display portion are parallel in a closed state. However, applicant claims the bottom surface of the electronic housing which houses the display and the bottom surface of the keyboard portion are parallel in an open state. Thus, the Applicant's invention is distinguished from the prior art.



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PAGE 01

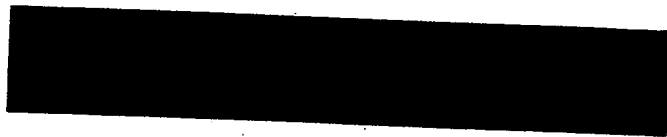
1855 South Loop West #170
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To:	DUC O DINH	From:	Delphine James
Fax:	700 872-6314	Date:	December 29, 2004
Phone:		Pages:	11
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<input type="checkbox"/> Urgent <input checked="" type="checkbox"/> For Review <input type="checkbox"/> Please Comment <input type="checkbox"/> Please Reply <input type="checkbox"/> Please Recycle			

Comments: Attached is the proposed response.

2656 South Loop West #170
Houston, Texas 77054
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Fax

To: DUC Q DINH	From: Delphine James.
Fax: 703 872-9314	Date: December 29, 2004
Phone:	Pages: 11
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•Comments: Attached is the proposed response.

Exhibit 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: SANG MIN LEE

Serial No.: 09/940,210

Group Art Unit: 2674

Title: COMPACT KEYBOARD FOR HANDHELD COMPUTER

Examiner: DUC Q DINH

AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Honorable Sir:

This amendment is filed in response to the final office action 6/30/2005.

IN THE SPECIFICATIONS

Referring now to FIG. 7, an overall perspective side view of another alternative embodiment of the present invention is seen, a handheld computerized device (700) in an open position. Device (700) can be a Personal Digital Assistant (PDA), Palm Computer or another portable computer with similar architecture. The present invention in no manner is limited by the particular structure, function, logical architecture or compatibility of device (700).

In the illustrated embodiment, device (700) comprises keyboard portion (710) and electronic housing (720). Keyboard portion (710) is depicted having a support base (715) and keypad (725). Support base (715) is depicted having a rectangular configuration with keypad (725) overlaying the top surface (730) of support base (715).

In the illustrated embodiment, device (700) further comprises a sliding bracket (735) having a pair of guide members (736, 737) and a corresponding pair of ribs (746, 747). As shown in the illustrated embodiment, each guide member (736, 737) is composed of a rectangular strip having a groove (738) along its inner horizontal plane. In this kind of embodiment, each side edge (755) of support base (715) is adapted with ribs ~~(736, 737)~~ (746, 747) that is configured to slide into the groove (738) of each corresponding guide member (736, 737). As shown FIG. 7A and FIG. 7B, after the keyboard portion (710) is completely slid into the guide members (736, 737), the keyboard portion (710) is securely held in place.

In the illustrated embodiment, device (700) further comprises electronic housing (720) having a rectangular configuration with a top surface (740), bottom surface (745) top edge ~~(741)~~ (742), bottom edge ~~(742)~~ (741), and a pair of side edges (743, 744). As illustrated in the embodiment, the pair of side edges (743, 744) of the electronic housing are integrally coupled to the pair of guide members (736, 737). With this alternative embodiment except for the addition of the sliding bracket (735), electronic housing (720) and keyboard portion (710) are structurally equivalent and functionally equivalent to electronic housing (200) and keyboard portion (300) of device (100) shown in FIG 1. Additionally, with this alternative embodiment, the internal schematic diagram illustrated in FIG. 4 for electronic housing (200) is also supported by electronic housing (720).

As shown in FIG. 7C, when device (700) is used, it is placed in an operable position by sliding ribs (746, 747) into guide members (735, 737) with the bottom surface (760) of

IN THE CLAIMS

1. (Previously Presented) A handheld computerized device comprising:
 - a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;
 - a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
 - a means for displaying data overlaying the top surface of the electronic housing; and
 - a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby data entered at the keypad is transmitted to the processor and displayed by the display means; and
 - a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
 - the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
2. (Previously Presented) The device recited in Claim 1, wherein the keypad further comprises:
 - ~~a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;~~
 - ~~the first and the second section lying co-planar vertically parallel along the top surface~~

- ~~of the support base of the keyboard portion;~~
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
3. (original) The device recited in Claim 1, wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
4. (Previously Presented) The device recited in Claim 3 wherein the display area is a Liquid Crystals Crystal Display (LCD).
5. (original) The device recited in Claim 3, wherein the bottom strip and each side strip of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
6. (original) The device recited in Claim 1, further comprising:
a pressure sensitive writing means for allowing data to be inputted via handwriting;
and
the pressure sensitive writing means overlapping the bottom edge of the display area.
7. (currently amended) A handheld computerized device comprising:
a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard portion in an operable position;

a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
a means for displaying data overlaying the top surface of the electronic housing; and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.

8. (original) The device recited in Claim 7, wherein the keypad further comprises:
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
9. (original) The device recited in Claim 7, wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
10. (Previously Presented) The device recited in Claim 9 wherein the display area is a Liquid Crystals Crystal Display (LCD).
11. (original) The device recited in Claim 10, wherein the bottom strip and each side strip of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.

12. (original) The device recited in Claim 7, further comprising:
a pressure sensitive writing means for allowing data to be inputted via handwriting;
and
the pressure sensitive writing means overlapping the bottom edge of the display area.
13. (currently amended) A handheld computerized device comprising:
a sliding bracket having a pair of guide members;
a keyboard portion having a support base and a keypad, the support base including a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being adapted to slide into the pair of guide members in an operable state or in a closed state, the keypad overlaying the top surface of the support base;
an electronic housing having a configuration with a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the pair of side edges being integrally coupled to the pair of guide members;
a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad;
in the operable state, the side edges of the support base are adapted to slide into the guide members such that the bottom surface of the support base and the bottom surface of the electronic housing are parallel to each other;
in the closed state, the side edges of the support base are adapted to slide into the guide members such that the keypad faces the ~~top~~ bottom surface of the electronic housing
a means for displaying data overlaying the top surface of the electronic housing; and
a processor situated within the electronic housing, the processor electrically connected to the display means and the keyboard portion whereby the data entered at the keypad is transmitted to the processor and displayed by the display means.
14. (original) The device recited in Claim 13, wherein the keypad further comprises:
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas;
the first and second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;

- the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
- the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand;
- 15.(original) The device recited in Claim 13, wherein the display means further comprises:
- a display area defined by a top edge, bottom edge, and a pair of side edges;
 - a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and
 - each edge of the display area lying adjacent to and being securely attached to each corresponding strip of the display area.
- 16.(Previously Presented) The device recited in Claim 15 wherein the display area is a Liquid Crystals Crystal Display (LCD).
- 17.(original) The device recited in Claim 15, wherein the bottom strip and each side strip of the front panel further comprises:
- a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof; and
 - a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
- 18.(original) The device recited in Claim 13, further comprising:
- a pressure sensitive writing means for allowing data to be inputted via handwriting;
 - and
 - the pressure sensitive writing means overlapping the bottom edge of the display area.
19. (Previously Presented) A handheld computerized device comprising:
- a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;
 - an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the

bottom surface of the electronic housing is parallel to the bottom surface of the support base;

a pair of hand support means being securely attached at an ergonomic position along each side edge of the electronic housing, whereby a user's left hand or right hand or both hands are supported while the user is typing on the keypad.

20. (Previously Presented): The device recited in Claim 19, wherein the keypad further comprises:
a first and a second section having a plurality of alphanumeric keys each adapted to generate a character signal upon depression thereof, each section being in the form of complementary symmetrical or asymmetrical parabolas,
the first and the second section lying co-planar vertically parallel along the top surface of the support base of the keyboard portion;
the first section of the keypad being arranged in the standard QWERTY keyboard format for the left hand; and
the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.
21. (Previously Presented) The device recited in Claim 19 wherein the display means further comprises:
a display area defined by a top edge, bottom edge, and a pair of side edges;
a front panel surrounding the display area and being defined by a top strip, a bottom strip, securely attached to each corresponding strip of the display area.
22. (Previously Presented): The device recited in Claim 21 wherein the display area is a Liquid Crystal Display (LCD).
23. (Previously Presented): The device recited in Claim 21 wherein the bottom strip and each side strip of the front panel further comprises:
a plurality of additional alphanumeric keys each adapted to generate a character signal upon depression thereof;
a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor.
24. (Previously Presented) The device recited in Claim 19 further comprising :
a pressure sensitive writing means for allowing data to be inputted via handwriting; and
the pressure sensitive writing means overlapping the bottom edge of the display area.

ARGUMENTS

I am reiterating my original response per our telephone interview on December 27, 2004 as follows. In his response, Examiner never discussed FIG. 6C of Brandenburg. Per our telephone conversation, I pointed out the significance of FIG. 6C.

Regarding claim 1, we agreed that Applicant's claimed invention could be distinguished from Blandenberg. Applicant claims:

a keyboard portion having a support base and a keypad, the support base defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the keypad overlaying the top surface of the support base;

an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base such that the electronic housing can pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base;

Blandenberg states:

As device 801 transitions to the open state, display portion 803 hingedly pivots relative to body portion 807 as indicated by arrow 809 in FIG. 6B. In the open state, display screen 815 is adjacent to and visible above thumbboard 805. Fig. 6a shows the closed state and Fig. 6B is still in the closed state to show the transition to FIG. 6C.

As shown in FIG. 6C, the invention in the prior art keyboard is adjacent to the keyboard in an open state. The prior illustrates in FIG. 6A and 6B that bottom surface of the keyboard and display portion are parallel in a closed state. However, applicant claims the electronic housing

having the display and the keyboard portion are parallel in an open state. Thus, the Applicant's invention is distinguished from the prior art. As shown in FIG.'S, 6A, 6B, and 6C, the lower edge of the display is hingedly connected to the top edge of the keyboard housing. As shown in FIG. 1 in the specification, the two top edges are hingedly connected as claimed.

Regarding independent claim 7, claim 7 was amended to claim an alternative embodiment of claim 1, wherein the invention is affixed into an operable position with the bottom surface of electronic housing (620) and keyboard portion (610) in a parallel position. (See Page 8 line 8-16 and FIG. 6)

Regarding independent claim 13, claim 13 was amended to claim an alternative embodiment of claim 1, wherein the invention is slid into an operable position with the bottom surface of electronic housing (720) and keyboard portion (710) in a parallel position. (See Page10 lines 3-5 and FIG. 7C).

112 REJECTION OF CLAIM 13

The specifications do more than just mention operable versus closed state. The Page 9 lines 9-29 through page 10 lines 1-8 discloses the full process. There are some typographical errors between the FIG.'S 7A-7C and the specifications. The disclosure can be amended to matter that is inherently disclosed by the original application. (*See In re Smyte, 480 F.2d 1376, 178 USPQ 279 (C.C.P.A.)*) As a result, applicant has amended the specifications to be in line with the drawings which are part of the original disclosure. Examiner alleges that the specifications fail to convey to one skilled in the art. Applicant has amended FIG 7A and 7B with labels in line with FIG 7 and FIG. 7C. Applicant has provided FIG. 7C for clarification. The specification was amended as follows (Please note that examiner and applicant discuss

these changes in a telephone conversation; these amendments could have been taken care of before final office action response):

- label (746,747) was replaced with 736, 737 to show rib designations. 746, 747 was designated as ribs earlier in the application. This is an obvious error that can be amended.
- labels 741 and 742 was changed because their designation are reversed in the drawings. This is an obvious error that can be amended.
- More designations were added to FIG. 7A and 7B for clarification and to bring them in line with FIG. 7 and 7C. These designations are taken directly from the drawings 7 and 7C which were disclosed in the original disclosure.
- 765 was changed to 745. 745 is depicted as bottom surface of the electronic housing in the specifications and drawings. This is an obvious error for amendment.
- a description of 7A and 7B was added for clarification for examiner. 7B was changed to 7A. 7A is the closed state. This is an obvious error that can be amended in view of the drawings.
- Claim 13 was amended for examiner clarification. As shown in FIG. 7A, in the closed state the keypad (125) faces the bottom surface of the electronic housing which is also stated in the specifications on Page 10, *"After the user is finished using device (700), the keyboard portion (710) is slid into guide members (735, 737) with the keypad (725) facing the bottom surface ~~(765)~~ (745) of electronic housing (720)"* As shown in the operable state in FIG. 7B, keypad 125 does not face the bottom surface of the electronic housing. However,

Applicant can change wording to state a parallel configuration which is also depicted in FIG. 7A if required by the examiner.

Drawings are considered part of the specifications. (*See Was-Cath, Inc v. Mahurkar, 935 F2d 1555, 19 USPQ2d 1111, 1118 (Fed. Cir. 1991)*). Fig.'s 7A-7C illustrates the configuration of operable and closed state of this embodiment of the present invention. The language of claim 13 comes directly from the specifications in conjunction with the drawings. It is not clear what examiner means by the specification do not reasonably convey to one skilled in the art.

Clarification is required because the drawings are clear. The description does not require literal support for the claimed invention. The disclosure should convey the concept that is claimed. (*See Ex Parte Parks 30 USPQ2d 1234, 1246-27 (B.P.A.I 1993)*) *Here, the do drawings provide the concept of the claimed invention.*

103 REJECTIONS

Examiner cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. A factual inquiry whether to combine references must be thorough and searching. A showing of suggestion, teaching or motivation to combine the prior art references is an essential component of an obvious holding. The prior art must suggest a desirability to combine prior art references. (See 277 F3d 1338, 61 USPQ2d 1430 (Fed. Cir 2002)).

Here, the examiner tried to use Brandenburg to fit the claim limitations of Applicant. However, Brandenburg does not teach or suggest the configuration as claimed by the applicant. Brandenburg teaches a pivoting of a display into a normal configuration with the display adjacent to the keyboard in an open state. The device in Brandenburg is not hingedly

connected as claimed by the Applicant. The hingedly connection between the two top edges facilitates the transitioning of the applicant's device the open state.

Ni illustrates a backside keyboard for a notebook computer or gamebox. Ni is new reference traversed by the examiner. Additionally, the Keyboard in Ni is not Parabolic and is not hingedly connected as claimed by the Applicant.

Ni nor Brandenburg discloses hand grips for supporting the hands while typing on the keyboard when the device is in the open state. In Brandenburg in FIG. 6C, a standard keyboard is shown. Thus hand support means on the side is not required. Label 827 in FIG. 6C designates joysticks. By plain definition joysticks are not used for hand support means. Thus, there is no motivation to combine Ni and Brandenburg. Additionally, it also follows that there is no motivation to combine Makala as well.

Examiner is reminded that Applicant has amended independent claims 7 and 13 to further distinguish with the prior art. In view of the above amendments to independent claims 7 and 13 and supporting argument to claim 1, Applicant respectfully requests that the rejections to the supporting dependent claims be withdrawn. Alternately should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he/she is invited to telephone the undersigned.

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CERTIFICATE OF MAILING AND FACISIMILE

I, Delphine James, hereby certify that the foregoing Response to the Office Action is being deposited on 11/30/2005 with the United States Postal Service as U.S. Express Mail. Additionally, the foregoing response is also being transmitted by Facsimile to _____.

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US006665173B2

Exhib. 14

(12) **United States Patent**
Brandenberg et al.

(10) **Patent No.:** **US 6,665,173 B2**
(45) **Date of Patent:** **Dec. 16, 2003**

(54) **PHYSICAL CONFIGURATION OF A HAND-HELD ELECTRONIC COMMUNICATION DEVICE**

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 165 days.

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(51) **Int. Cl.⁷** **G06F 1/16**

(52) **U.S. Cl.** **361/680; 361/683; 345/905; 349/84; 400/682; 312/223.1**

(58) **Field of Search** **361/679-686, 361/724-727; 345/905, 156, 169; 349/58; 312/223.1-223.2; 400/88, 682**

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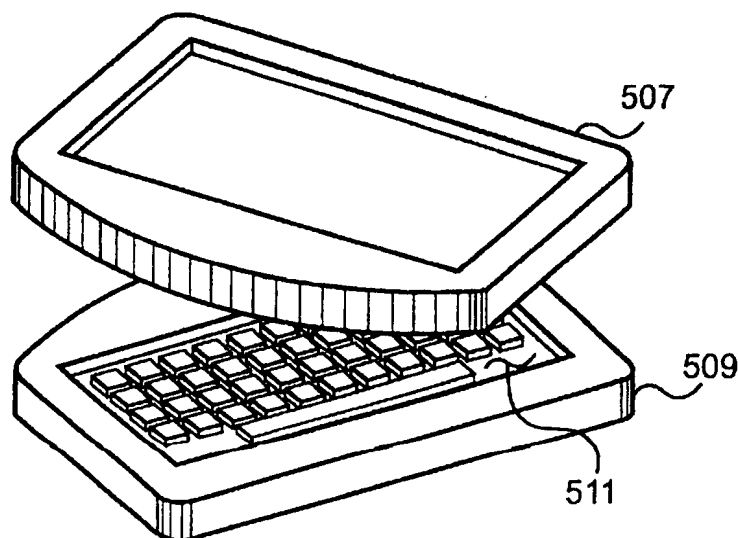
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(57) **ABSTRACT**

A hand-held, electronic, bi-directional, wireless electronic communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed.

20 Claims, 13 Drawing Sheets



PHYSICAL CONFIGURATION OF A HAND-HELD ELECTRONIC COMMUNICATION DEVICE

This application claims the benefit of U.S. Provisional Application No. 60/172,675, filed Dec. 20, 1999, titled "Physical Configuration of a Handheld Electronic Communication Device."

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the physical configuration of hand-held, electronic devices. In particular, the present invention relates to the physical configuration of hand-held, electronic devices capable of bi-directional, wireless data communication.

2. Background Information

Until now, hand-held, wireless devices have primarily been used for person-to-person communication by voice, transmitting and receiving voice data in real-time. These "mobile phone" devices have allowed users to go wherever they like and still be in touch with their friends and colleagues just as though they were using a wired phone at home or work. Communication by textual means, such as e-mail, has been performed almost exclusively over land-based copper and fiber optic phone lines, because the wireless communication networks have simply not had the capacity or capability to provide cost effective, wireless transmission of textual data. But recent advancements in wireless technology have made it possible to provide cost-effective data transfer over existing wireless networks.

The most common means of textual communication has been e-mail, but a relatively new form of messaging called "instant messaging" (IM) has caught on and has grown very rapidly in popularity in the last several years. Unlike e-mail which sits in an electronic mailbox until the user retrieves his or her e-mail messages, IM occurs nearly instantaneously, producing a notification and a dialog box on a user's screen alerting the user that they have an incoming message. In addition, users have the ability to know if the recipient is on-line and available to receive an IM message.

Many hand-held, wireless devices are beginning to provide access to e-mail, but their functionality is currently very limited. The user is usually limited to browsing, that is receiving and reviewing the information, not authoring and sending data. Much like retrieving voice messages from a voice mailbox, the user is only able to retrieve e-mail messages from their e-mail inbox. The primary reason for this is that authoring messages requires a convenient method of alphanumeric data entry. Users are hesitant or reluctant to enter a message if the data entry process is slow and difficult. This is a problem that conventional devices cannot properly address due to user interface limitations, i.e., the capabilities, design, and layout of the physical devices. While e-mail may require entry of a moderate length message in response to a received message, such data entry usually happens at a time the user deems appropriate and convenient, not at a time dictated by the sender of the message. This is very much like the user being able to periodically check voice messages in a voice mailbox, and respond at the user's convenience.

However, IM and other types of instantaneous textual and graphical communication are more real-time and intrusive than e-mail; the same way that an incoming phone call is more real-time and intrusive than checking voice messages. IM is a much more frequently accessed and used system than

an e-mail client; therefore, IM requires a network and device that are much more convenient to use than an e-mail client. Such a level of convenience has been possible with wired connections and desktop computers. With traditional desktop computers, the computer is placed on or near the work surface and the display and keyboard are easily accessible. The user can immediately see incoming IM messages presented on the display, then respond to the IM messages using the keyboard. The user does not have to remove a device from the user's belt clip or pocket and open the device to see the IM message. Neither does the user have to then locate a work surface for support and connect a peripheral keyboard in order to compose a response.

There are a variety of devices available that are capable of providing wireless access to textual information, such as mobile phones, personal digital assistants (PDA's), hand-held computers, and two-way pagers, but the compromises in all of these designs limit their suitability as IM devices. For some of these devices, the displays are always visible and easy to see, but the device lacks an input device, has a small and inappropriate input device, has a slow and error prone method of data entry, or requires additional peripheral devices and a work surface for support. For other devices, a suitable input device is present, but the device transforms between multiple states which prevent the display from being seen in one of the states, limiting the convenience of using the device on a frequent basis.

Conventional wireless communication devices can be categorized into several distinct configurations: (1) mobile phones, commonly known as cellular phones; (2) personal digital assistants, commonly referred to as PDA's; (3) hand-held computers, commonly referred to as palmtop computers; and (4) two-way pagers.

The configuration of a mobile phone typically consists of: (1) a small display that is always visible; (2) a keypad for numeric data entry; and (3) an internal communication module that can transmit and receive analog and/or digitized voice data.

The mobile phone configuration has the following disadvantages: (1) the display is typically very small and inappropriate for display of large amounts of textual data, i.e., they are typically proportioned for one or two rows of phone numbers and proper names, not textual data in the structure of a written sentence; (2) the keypad is commonly located adjacent to the display, increasing the overall size of the unit; (3) on some units, the device has a clamshell design that obscures both the keypad and display when closed; (4) the keypad is typically a twelve-digit keypad designed for numeric data entry, although the keyboard usually supports alphanumeric character entry for the purpose of entering proper names into an address book maintained in the phone's memory, whereby the commonly used method of accessing alphanumeric characters is to switch the device into a text entry mode, then press a key repeatedly to access a particular one of a subset of characters available for each key, this method being extremely slow, awkward, error prone, and not appropriate for a device intended to transfer textual data on a regular basis; and (5) the communication module is typically engineered to support voice communication, and in only the latest device versions, limited retrieval of alphanumeric data.

The configuration of a PDA typically consists of: (1) a large display that is always visible; (2) a touch screen and stylus for data entry; (3) no keyboard for data entry; and (4) no internal communication module.

The PDA configuration has the following disadvantages: (1) the device has no keyboard, so alphanumeric data entry

is usually performed in one of two ways: (a) the user taps with a hand-held stylus on a "soft" keyboard that is drawn on the display, or (b) the user writes on screen with a hand-held stylus and the processor converts the user's writing into text data; (2) an optional detachable keyboard may be available, but the keyboard usually requires a flat surface for support during use as it is tethered to the device by a cable or attaches in such a way that it will easily become detached if tilted, thus making the keyboard extremely awkward for use in one hand while on the move; and (5) the device lacks a communication module, although modules may sometimes be added, but at the expense of consuming the port available for connecting the optional keyboard to.

The configuration of a palmtop computer typically consists of: (1) a large display screen; (2) a complete keyboard; (3) a clamshell design where the display closes over the keyboard, or a flat layout where the display is located adjacent to the display; and (4) no internal communication module.

The palmtop configuration has the following disadvantages: (1) although the clamshell design affords protection to the display and keyboard when the device is closed, the clamshell design often renders the display non-visible when the device is closed, and is not adequate for frequent presentation of information to a user on the move; and (2) the relatively large size makes the device prohibitive for use as an IM device, because when a large display and keyboard are present, the device becomes inconvenient for the user to carry on a regular basis, resulting in the usability of the display and keyboard being greatly reduced.

The configuration of a two-way pager typically consists of: (1) a small display screen; (2) a small, complete keyboard; and (3) a flat layout where the keyboard is located adjacent to the display, or clamshell design where the display folds over the keyboard when closed.

The two-way pager configuration has the following disadvantages: (1) units with a flat layout have displays that are always visible, but to keep the overall device size down, the display and keyboard are reduced to minuscule dimensions which greatly reduces their usability; and (2) units with a clamshell design, render the display non-visible when the unit is closed, adding inconvenience when the user must look at the display.

The distinction between each category of devices is blurring daily, but a trend is very evident in all the previously mentioned devices. The devices are either: (1) designed primarily for voice communication and have limited alphanumeric entry capability, or a capability that is not suited to use in your hands while on the move; or (2) designed primarily for occasional retrieval and display of textual information and have a design that is very inconvenient for frequent input and viewing of data while on the move.

Some of these concepts are embodied in the following U.S. patents: U.S. Design Pat. No. Des. 416,256 issued to Griffin et al. which discloses a hand-held messaging device with keyboard; U.S. Pat. No. 5,548,478 issued to Kumar et al. which discloses a portable computing device having an adjustable hinge; U.S. Pat. No. 5,638,257 issued to Kumar et al. which discloses a combination keyboard and cover for a hand-held computer. U.S. Pat. No. 5,712,760 issued to Coulon et al. which discloses a compact foldable keyboard; and U.S. Pat. No. 5,949,408 issued to Kang et al. which discloses a dual orientation display hand-held computer. These devices either have fixed keyboards or use folding clamshell designs. As such, they are not good choices for IM and other types of instantaneous textual and graphical communication.

Although the devices, designs, and physical configurations discussed above represent great strides in the area of physical configuration of hand-held communication devices, many shortcomings remain.

SUMMARY OF THE INVENTION

There is a need for a hand-held, electronic, bi-directional, wireless communication device that 1) contains a relatively large, constantly visible display capable of rich presentation of information, 2) that contains an alphanumeric keyboard that is usable by human hands and 3) that is small enough to carry and convenient enough to use under usage conditions typically encountered with a mobile phone device.

Therefore, it is an object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion that translates relative to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard carried by the body portion, the alphanumeric keyboard being concealed by the display portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless electronic communication device having a physical configuration which includes a body portion, a display portion that pivots relative to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard carried by the body portion, the alphanumeric keyboard being concealed by the display portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion coupled to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard that translates into the interior of the body portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion coupled to the body portion, a relatively large, constantly visible display carried by the display portion, and a two-piece alphanumeric keyboard that translates into the interior of the body portion when not in use.

These objects are achieved by providing a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed. The communication device of the present invention has a physical configuration operable between an "open" state in which the alphanumeric keyboard is visible, and a "closed" state in which the alphanumeric keyboard is concealed. This allows the information presented by the communication device to be viewable in either the open or closed state. A user can quickly and easily transform the device from the closed state to the open state with either one or two hands, while viewing

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the constantly visible display without interruption. The display is larger than those used on mobile phones and can display text and graphics at a convenient size and resolution. The alphanumeric keyboard is easier and faster to use and learn than the keypads and touch screens on most mobile phones and personal digital assistants. The keyboard may be a keyboard with a layout such as the common "QWERTY" layout, but need not be limited to this particular layout. Other layouts may include the "FITALLY" layout, the "Dvorak" layout or any other alphanumeric layout that includes a substantially full set of alphanumeric keys.

The present invention has many advantages over existing device configurations. Because the display is constantly visible, the user can immediately see incoming messages or communications and respond appropriately. The display is relatively large to accommodate long textual messages, graphical communications, or a combination of both. The user can quickly and easily transform the device from the closed state to the open state without his view of the display being interrupted. The full alphanumeric keyboard allows the user to quickly and easily transmit messages and other textual and graphical communications in a complete and intuitive manner without having to attach peripheral devices. The unique physical configuration of the present invention is not only effortless to learn and use, it encourages users to participate in these new forms of communication.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a perspective view of a simplified representation of the hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 1B is a perspective view of the device of FIG. 1A depicting how a constantly visible display translates relative to a body portion to expose a keyboard or other data input device that is carried by a body portion.

FIG. 1C is a perspective view of the device of FIG. 1A with the constantly visible display in a position which fully reveals the keyboard or data input device.

FIG. 2A is a perspective view of an alternate simplified representation of a hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 2B is a perspective view of the device of FIG. 2A depicting how a constantly visible display pivots relative to a body portion to reveal a keyboard or other data input device.

FIG. 2C is a perspective view of the device of FIG. 2A depicting how the constantly visible display further pivots relative to the body portion to reveal the keyboard or other data input device.

FIG. 2D is a perspective view of the device of FIG. 2A with the constantly visible display pivoted to fully reveal the keyboard or other input device.

FIG. 3A is a perspective view of an alternate simplified representation of a hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 3B is a perspective view of the device of FIG. 3A depicting how a keyboard or other data input device extends outward from the interior of a body portion.

FIG. 3C is a perspective view of the device of FIG. 3A with the keyboard or other data input device in a fully extended position.

FIG. 4A is a front view of a hand-held, electronic, bi-directional wireless communication device having a

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physical configuration of the type illustrated in FIGS. 1A-1C in a closed state.

FIG. 4B is a rear view of the device of FIG. 4A.

FIG. 4C is a right side view of the device of FIG. 4A.

FIG. 4D is a bottom view of the device of FIG. 4A.

FIG. 4E is a front view of the device of FIG. 4A in an open state in which a constantly visible display is translated relative to a body portion to fully reveal a keyboard or other input device.

FIG. 4F is a rear view of the device of FIG. 4A while in the open state of FIG. 4E.

FIG. 5A is a front view of an alternate hand-held, electronic, bi-directional wireless communication device having a physical configuration of the type illustrated in FIGS. 1A-1C in a closed state.

FIG. 5B is a rear view of the device of FIG. 5A.

FIG. 5C is a right side view of the device of FIG. 5A.

FIG. 5D is a front view of the device of FIG. 5A in an open state in which a constantly visible display is translated relative to a body portion to fully reveal a keyboard or other input device.

FIG. 6A is a front view of a hand-held, electronic, bi-directional wireless communication device having a clamshell-type physical configuration in which a keyboard or other input device hingedly pivots relative to a constantly visible display.

FIG. 6B is a right side view of the device of FIG. 6A.

FIG. 6C is a front view of the device of FIG. 6A with the keyboard or other input device fully pivoted relative to the constantly visible display fully reveal the keyboard or other input device.

FIG. 7A is a front view of a hand-held, electronic, bi-directional wireless communication device having a physical configuration of the type illustrated in FIGS. 3A-3C.

FIG. 7B is a rear view of the device of FIG. 7A.

FIG. 7C is a right side view of the device of FIG. 7A.

FIG. 7D is a front view of the device of FIG. 7A with a two-piece keyboard fully extended outward from the interior of a body portion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring generally to FIGS. 1A-1C, 2A-2D, and 3A-3C in the drawings, simplified representations of a hand-held, electronic communication device having a physical configuration according to the present invention are illustrated. To be convenient for IM and other instantaneous textual and graphical communications, a device must be able to support effortless reading of incoming IM messages and rapid entry of responses. Such support minimizes the inconvenience of the intrusion of the IM message. The device should allow a minimum amount of effort to perform the tasks involved when using IM.

The device configuration of the present invention provides the following unique and distinct features:

1. A relatively large display screen capable of displaying textual and graphical information, allowing for a rich presentation of information;
2. A display screen that is always visible. If, for example, the device must transition from a closed state that is characterized by maximum portability to an open state that is characterized by maximum usability, the display

is constantly visible in each state. Users are very intolerant of a device that must be manipulated and opened in order to view the display each and every time a message or notification occurs;

3. An alphanumeric data entry means that is suitable for use with human hands without the aid of an additional pointing device such as a stylus and that is designed for rapid entry of alphanumeric data; and
4. A relatively small size which makes the device convenient for portable use and allows the device to be operated, ideally, with one or two hands.

To ensure that the device of the present invention is appropriate for mobile use, the device is small and convenient to carry and use. The device is capable of being configured in at least two distinct states that maximize both its portability and usability. One device state maintains a small footprint, whereby the device consumes a minimal amount of volume and affords a greater level of portability and concealment, herein called the "closed" state. In this closed state, the display is visible, but the keyboard is concealed to minimize space and maximize portability. A second device state affords a more efficient level of alphanumeric data entry, herein called the "open" state. In the open state, the display is visible and the keyboard is accessible to maximize usability. The device can transition from the open state to the closed state easily and with a minimum of effort, preferably with one hand. Preferably, the display translates relative to the main housing to reveal the keyboard. However, the display may either pivot or rotate relative to the housing to reveal the keyboard, or the keyboard may telescope into the interior of the housing. In the preferred embodiment, the device's display remains visible in either state, allowing the user to observe incoming messages without having to manipulate the device to transition it from one state to another, such as from closed to open.

In order to overcome the limitations of current hand-held, electronic devices that serve or can be adapted to the purpose of bi-directional, wireless communication of textual and graphical information, the present invention provides a new and improved configuration of a device that allows for the inclusion in the device of both a large, always visible display screen and an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The device of the present invention preferably has a large, color display screen capable of displaying textual and graphical information for rich presentation of information. Because the display screen is always visible and hence exposed and susceptible to damage, a cover made of either a rigid or flaccid material to afford protection may protect the display. The cover may be of a material such as a clear plastic or rubber that allows the display to remain visible even when covered. Further, the device of the present invention has an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The present invention provides a configuration such that the device can be held and operated with one or two hands in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The device of the present invention comprises at least the following components: (1) an alphanumeric data input device, such as a full QWERTY-type keyboard or thumbboard; (2) a display device, such as an LCD, LED, or LEP display screen; (3) a processor; (4) a power source, such as a battery or mechanical generator like a wind-up spring mechanism; (5) a communication module, such as a CDPD, CDMA, GSM or GPRS radio capable of wireless data

transmission and reception; and (6) a physical housing that contains these components and that consists of at least two discrete portions that may translate, rotate and/or pivot relative to one another, one portion containing a display device and one portion containing a keyboard.

The display, preferably color, is always visible as the device transitions from a closed state characterized by maximum portability to an open state characterized by maximum usability. The display may translate, rotate, or revolve relative to the main housing of the device. The display will be large enough to accommodate simultaneous textual messages, graphical displays, and graphical animations. The device and corresponding wireless network include integral support of IM and other instantaneous textual and graphical communication. The exterior layout of the device is heavily influenced by the capability to effectively utilize these types of instantaneous communication.

Although the device may be placed in an "off" state in which no power is supplied to the device, it is preferred that the device remain either in an "on" state in which the device has full functionality, or a "sleep" state in which the device may appear to the user to be off, but is, in fact, performing certain background functions. In the fully functional "on" state, the device is displaying digital content and the user is interacting with the device. In the "sleep" state, the user is not interacting with the device and the display screen on the device has cycled down and is not actively displaying digital content. In the sleep state, the display screen may be blank or may be displaying a preprogrammed graphic or image. If the device is in the sleep state and the user begins to interact with the device, or if the user receives a "hot" communication, the device immediately switches from the sleep state to the on state so that the user may fully utilize all features and functionality of the device.

The device may include a variety of additional input/output components, such as lights, LED's, buttons, joysticks, a touch pad, an analog responder, and others components which allow the user to view information and manipulate the device to a certain degree without transitioning the device to the open state.

A first device configuration is specifically depicted in FIGS. 1A-1C. A constantly visible display 501 translates relative to a body portion 503 to reveal a full QWERTY-type keyboard or other input device 505. This first device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the full keyboard or other input device; (3) the display is generally parallel with the keyboard or other input device and translates relative to the body portion such that the keyboard or other input device is revealed when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the display translates in a plane that is generally parallel to the plane of the keyboard or other input device.

A second device configuration is specifically depicted in FIGS. 2A-2D. A constantly visible display 507 pivots relative to a body portion 509 to reveal a full QWERTY-type keyboard or other input device 511. This second device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state

is constantly visible in each state. Users are very intolerant of a device that must be manipulated and opened in order to view the display each and every time a message or notification occurs;

3. An alphanumeric data entry means that is suitable for use with human hands without the aid of an additional pointing device such as a stylus and that is designed for rapid entry of alphanumeric data; and
4. A relatively small size which makes the device convenient for portable use and allows the device to be operated, ideally, with one or two hands.

To ensure that the device of the present invention is appropriate for mobile use, the device is small and convenient to carry and use. The device is capable of being configured in at least two distinct states that maximize both its portability and usability. One device state maintains a small footprint, whereby the device consumes a minimal amount of volume and affords a greater level of portability and concealment, herein called the "closed" state. In this closed state, the display is visible, but the keyboard is concealed to minimize space and maximize portability. A second device state affords a more efficient level of alphanumeric data entry, herein called the "open" state. In the open state, the display is visible and the keyboard is accessible to maximize usability. The device can transition from the open state to the closed state easily and with a minimum of effort, preferably with one hand. Preferably, the display translates relative to the main housing to reveal the keyboard. However, the display may either pivot or rotate relative to the housing to reveal the keyboard, or the keyboard may telescope into the interior of the housing. In the preferred embodiment, the device's display remains visible in either state, allowing the user to observe incoming messages without having to manipulate the device to transition it from one state to another, such as from closed to open.

In order to overcome the limitations of current hand-held, electronic devices that serve or can be adapted to the purpose of bi-directional, wireless communication of textual and graphical information, the present invention provides a new and improved configuration of a device that allows for the inclusion in the device of both a large, always visible display screen and an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The device of the present invention preferably has a large, color display screen capable of displaying textual and graphical information for rich presentation of information. Because the display screen is always visible and hence exposed and susceptible to damage, a cover made of either a rigid or flaccid material to afford protection may protect the display. The cover may be of a material such as a clear plastic or rubber that allows the display to remain visible even when covered. Further, the device of the present invention has an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The present invention provides a configuration such that the device can be held and operated with one or two hands in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The device of the present invention comprises at least the following components: (1) an alphanumeric data input device, such as a full QWERTY-type keyboard or thumbboard; (2) a display device, such as an LCD, LED, or LEP display screen; (3) a processor; (4) a power source, such as a battery or mechanical generator like a wind-up spring mechanism; (5) a communication module, such as a CDPD, CDMA, GSM or GPRS radio capable of wireless data

transmission and reception; and (6) a physical housing that contains these components and that consists of at least two discrete portions that may translate, rotate and/or pivot relative to one another, one portion containing a display device and one portion containing a keyboard.

The display, preferably color, is always visible as the device transitions from a closed state characterized by maximum portability to an open state characterized by maximum usability. The display may translate, rotate, or revolve relative to the main housing of the device. The display will be large enough to accommodate simultaneous textual messages, graphical displays, and graphical animations. The device and corresponding wireless network include integral support of IM and other instantaneous textual and graphical communication. The exterior layout of the device is heavily influenced by the capability to effectively utilize these types of instantaneous communication.

Although the device may be placed in an "off" state in which no power is supplied to the device, it is preferred that the device remain either in an "on" state in which the device has full functionality, or a "sleep" state in which the device may appear to the user to be off, but is, in fact, performing certain background functions. In the fully functional "on" state, the device is displaying digital content and the user is interacting with the device. In the "sleep" state, the user is not interacting with the device and the display screen on the device has cycled down and is not actively displaying digital content. In the sleep state, the display screen may be blank or may be displaying a preprogrammed graphic or image. If the device is in the sleep state and the user begins to interact with the device, or if the user receives a "hot" communication, the device immediately switches from the sleep state to the on state so that the user may fully utilize all features and functionality of the device.

The device may include a variety of additional input/output components, such as lights, LED's, buttons, joysticks, a touch pad, an analog responder, and others components which allow the user to view information and manipulate the device to a certain degree without transitioning the device to the open state.

A first device configuration is specifically depicted in FIGS. 1A-1C. A constantly visible display 501 translates relative to a body portion 503 to reveal a full QWERTY-type keyboard or other input device 505. This first device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the full keyboard or other input device; (3) the display is generally parallel with the keyboard or other input device and translates relative to the body portion such that the keyboard or other input device is revealed when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the display translates in a plane that is generally parallel to the plane of the keyboard or other input device.

A second device configuration is specifically depicted in FIGS. 2A-2D. A constantly visible display 507 pivots relative to a body portion 509 to reveal a full QWERTY-type keyboard or other input device 511. This second device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state

to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

A third device configuration is specifically depicted in FIGS. 3A-3C. An input device 513 translates into a body portion 515 which carries an always visible display 517. This third device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the keyboard display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

Regardless of the configuration chosen, the device is a hand-held device that can be held by one or two hands and conveniently carried or worn by the user on his or her person. The device is operated in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The preferred configuration of a device 601 according to the present invention is illustrated in FIGS. 4A-4F. The physical configuration of device 601 corresponds to the configuration illustrated in FIGS. 1A-1C. In FIGS. 4A-4D, device 601 is shown in the closed state in which an always visible display portion 603 conceals a novel QWERTY-type thumbboard 605 that is carried by a body portion 607. In FIGS. 4E and 4F, device 601 is shown in an open state in which display portion 603 has been translated relative to body portion 607 to reveal thumbboard 605. As is best seen in FIG. 4F, display portion 603 may include a plurality of rigid support rails 611 that telescope into body portion 607 to provide additional support of display portion 603 while device 601 is in the open state. It should be understood that other support means, such as interlocking grooves on display portion 603 and body portion 607 may also be used to provide additional support for display portion 603. Display portion 603 is dimensioned to house a plurality of components (not shown). Such components may or may not be directly related to the display of images, such as a GPS antenna and integrated circuit boards. Likewise, body portion 607 is dimensioned to house a plurality of electronic components and systems and necessary integrated circuit boards, such as the microprocessor (not shown) and cache memory (not shown).

Display portion 603 includes a display screen 615. Display screen 615 is preferably a high-resolution, 16-bit color, reflective LCD screen being 320x240 pixels having a diagonal display area of about 3.8 inches. It should be understood that other comparable display screens may be used. Although always visible, display screen 615 will cycle down to a "power save" mode during periods of non-use to conserve power. A cover or shade (not shown) may be utilized to protect display screen 615 from damage, to enhance visibility, to prevent glare, or to alleviate or minimize other common problems associated with such display screens. In the preferred embodiment, display screen 615 is covered by a protective bezel (not shown).

Device 601 is powered by a portable power supply (not shown), such as batteries. In this regard, a power supply cover 613 is provided to cover and protect the portable power supply. In the preferred embodiment, the portable power supply is rechargeable by placing device 601 in a docking station or charging station (not shown). Although device 601 operates on DC current, device 601 may be plugged into and powered by a conventional 110-Volt wall

outlet (not shown) with the use of a conventionally functioning AC to DC power transformer (not shown).

A plurality of push pads 617 are located at selected locations on display portion 603. Push pads 617 are preferably located such that the user may translate display portion 603 relative to body portion 607 by pushing on push pads 617 with his thumb or thumbs. In the preferred embodiment, display portion 603 is preferably made of rigid, molded plastic or similar material. Body portion 607 is preferably made of a similar material. As has become popular in recent years, display portion 603 and/or body portion 607 may be partially transparent or translucent, having a colored tint. A plurality of protective bumpers 619, preferably made of rubber or rubberized plastic, are coupled to display portion 603 and body portion 607 at selected locations. A plurality of raised grips 621 may be integrated into protective bumpers 619 to facilitate handling of and interaction with device 601. Device 601 may be of modular construction so that a plurality of the external components may be quickly and easily interchanged. Such interchangeability allows the user to choose from a wide variety of exterior styles and designs, thereby customizing device 601 to the user's particular tastes. In this manner, the appearance of device 601 can be modified to suit the user's ever changing moods and attitudes.

Device 601 includes a plurality of input/output devices, such as LED's 623, at least one speaker 625, a plurality of joysticks 627, conductive power terminals 629 for attachment to the docking station, an infrared (IR) port 631 for the transfer of data, a DC adapter port 633 for attachment of the power transformer, a headphone jack 635 for use with headphone speakers, an on-off switch 637 for toggling device between an "on" state, an "off" state, and/or a "standby" state, as further explained herein, and an analog responder 639. It will be appreciated that LED's 623, joysticks 627, and on-off switch 637 may be multifunctional. For instance, LED's 623 are preferably full-spectrum color LED's that can be selectively programmed by the user to display selected colors at selected intensities and/or selected flash frequencies in response to certain conditions. LED's 623 are particularly useful when display screen 615 has cycled down into the power save mode. This allows the user to interact with device 601 without transitioning device into the open state. By using only LED's 623, speaker 625, joysticks 627, IR port 631, and analog responder 639, a user can perform a considerable amount of input/output without transitioning device 601 into the open state.

Analog responder 639 is a one-dimensional, electronic touch pad disposed within device 601. Analog responder 639 is activated by the user touching selected areas of device 601. Preferably, analog responder 639 is disposed within and centrally located along a lower edge of body portion 607 closest to the user. Such location allows analog responder 639 to be usable when device 601 is either in the closed state or the open state, i.e., when display portion 603 is translated relative to body portion 607. It is preferred that analog responder 639 be adjacent or in close proximity to display screen 615, because analog responder 639 functions primarily to manipulate a cursor or graphical images being displayed on display screen 615. The one-dimensional functional boundaries of analog responder 639 are preferably indicated by raised end ridges 641 or similar visual indicia. For example, one boundary may be indicated by a "-" sign and the opposing end boundary may be indicated by a "+" sign. Such indicia are particularly useful because a primary function of analog responder 639 is to allow the user to

to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

A third device configuration is specifically depicted in FIGS. 3A-3C. An input device 513 translates into a body portion 515 which carries an always visible display 517. This third device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the keyboard display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

Regardless of the configuration chosen, the device is a hand-held device that can be held by one or two hands and conveniently carried or worn by the user on his or her person. The device is operated in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The preferred configuration of a device 601 according to the present invention is illustrated in FIGS. 4A-4F. The physical configuration of device 601 corresponds to the configuration illustrated in FIGS. 1A-1C. In FIGS. 4A-4D, device 601 is shown in the closed state in which an always visible display portion 603 conceals a novel QWERTY-type thumbboard 605 that is carried by a body portion 607. In FIGS. 4E and 4F, device 601 is shown in an open state in which display portion 603 has been translated relative to body portion 607 to reveal thumbboard 605. As is best seen in FIG. 4F, display portion 603 may include a plurality of rigid support rails 611 that telescope into body portion 607 to provide additional support of display portion 603 while device 601 is in the open state. It should be understood that other support means, such as interlocking grooves on display portion 603 and body portion 607 may also be used to provide additional support for display portion 603. Display portion 603 is dimensioned to house a plurality of components (not shown). Such components may or may not be directly related to the display of images, such as a GPS antenna and integrated circuit boards. Likewise, body portion 607 is dimensioned to house a plurality of electronic components and systems and necessary integrated circuit boards, such as the microprocessor (not shown) and cache memory (not shown).

Display portion 603 includes a display screen 615. Display screen 615 is preferably a high-resolution, 16-bit color, reflective LCD screen being 320x240 pixels having a diagonal display area of about 3.8 inches. It should be understood that other comparable display screens may be used. Although always visible, display screen 615 will cycle down to a "power save" mode during periods of non-use to conserve power. A cover or shade (not shown) may be utilized to protect display screen 615 from damage, to enhance visibility, to prevent glare, or to alleviate or minimize other common problems associated with such display screens. In the preferred embodiment, display screen 615 is covered by a protective bezel (not shown).

Device 601 is powered by a portable power supply (not shown), such as batteries. In this regard, a power supply cover 613 is provided to cover and protect the portable power supply. In the preferred embodiment, the portable power supply is rechargeable by placing device 601 in a docking station or charging station (not shown). Although device 601 operates on DC current, device 601 may be plugged into and powered by a conventional 110-Volt wall

outlet (not shown) with the use of a conventionally functioning AC to DC power transformer (not shown).

A plurality of push pads 617 are located at selected locations on display portion 603. Push pads 617 are preferably located such that the user may translate display portion 603 relative to body portion 607 by pushing on push pads 617 with his thumb or thumbs. In the preferred embodiment, display portion 603 is preferably made of rigid, molded plastic or similar material. Body portion 607 is preferably made of a similar material. As has become popular in recent years, display portion 603 and/or body portion 607 may be partially transparent or translucent, having a colored tint. A plurality of protective bumpers 619, preferably made of rubber or rubberized plastic, are coupled to display portion 603 and body portion 607 at selected locations. A plurality of raised grips 621 may be integrated into protective bumpers 619 to facilitate handling of and interaction with device 601. Device 601 may be of modular construction so that a plurality of the external components may be quickly and easily interchanged. Such interchangeability allows the user to choose from a wide variety of exterior styles and designs, thereby customizing device 601 to the user's particular tastes. In this manner, the appearance of device 601 can be modified to suit the user's ever changing moods and attitudes.

Device 601 includes a plurality of input/output devices, such as LED's 623, at least one speaker 625, a plurality of joysticks 627, conductive power terminals 629 for attachment to the docking station, an infrared (IR) port 631 for the transfer of data, a DC adapter port 633 for attachment of the power transformer, a headphone jack 635 for use with headphone speakers, an on-off switch 637 for toggling device between an "on" state, an "off" state, and/or a "standby" state, as further explained herein, and an analog responder 639. It will be appreciated that LED's 623, joysticks 627, and on-off switch 637 may be multi-functional. For instance, LED's 623 are preferably full-spectrum color LED's that can be selectively programmed by the user to display selected colors at selected intensities and/or selected flash frequencies in response to certain conditions. LED's 623 are particularly useful when display screen 615 has cycled down into the power save mode. This allows the user to interact with device 601 without transitioning device into the open state. By using only LED's 623, speaker 625, joysticks 627, IR port 631, and analog responder 639, a user can perform a considerable amount of input/output without transitioning device 601 into the open state.

Analog responder 639 is a one-dimensional, electronic touch pad disposed within device 601. Analog responder 639 is activated by the user touching selected areas of device 601. Preferably, analog responder 639 is disposed within and centrally located along a lower edge of body portion 607 closest to the user. Such location allows analog responder 639 to be usable when device 601 is either in the closed state or the open state, i.e., when display portion 603 is translated relative to body portion 607. It is preferred that analog responder 639 be adjacent or in close proximity to display screen 615, because analog responder 639 functions primarily to manipulate a cursor or graphical images being displayed on display screen 615. The one-dimensional functional boundaries of analog responder 639 are preferably indicated by raised end ridges 641 or similar visual indicia. For example, one boundary may be indicated by a "-" sign and the opposing end boundary may be indicated by a "+" sign. Such indicia are particularly useful because a primary function of analog responder 639 is to allow the user to

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selectively input a response to a query from an analog range of possible responses. Using the current example, the end boundary indicated by the "-" might represent a negative response by the user to a query, such as "I do not like pizza;" whereas the end boundary indicated by the "+" might represent a positive response by the user to the same query, such as "I love pizza." In a similar fashion, analog responder 639 is visually segmented, preferably by raised intermediate ridges 643, or similar visual indicia placed incrementally along the length of analog responder 639 between end ridges 641. In the preferred embodiment, intermediate ridges 643 are more pronounced at the center 645 of analog responder 639 and decrease in size or shape, if applicable, toward end ridges 641. This allows the user to quickly determine which portion of analog responder 639 the user is touching, tapping, or depressing.

Referring now to FIGS. 5A-5D in the drawings, an alternate embodiment of the device of the present invention is illustrated. As with device 601, a device 701 has an always visible display portion 703 and a body portion 707. The physical configuration of device 701 corresponds to the configuration illustrated in FIGS. 1A-1C. Display portion 703 carries a display screen 715, similar in form and function to display screen 615. Display portion 703 translates relative to body portion 707 to reveal a QWERTY-type thumbboard 705 which is similar in form and function as thumbboard 605. As is shown, device 701 includes similar input/output ports and devices as device 601, such as LED's 723, at least one speaker 725, a plurality of joysticks 727, and an analog responder 739. In addition, device 701 includes a conventional two-dimensional touch pad 729 on the backside of device 701. Touch pad 729 is located such that it can be utilized by the user while device 701 is in either the closed state or the open state. Touch pad 729 may be programmed to map to display screen 715 in either an absolute mode or a relative mode.

Referring now to FIGS. 6A-6C in the drawings, another alternate embodiment of the device of the present invention is illustrated. In this embodiment, a device 801 has a clam-shell design. As with previously discussed embodiments, device 801 has an always visible display portion 803 and a body portion 807 which carries a novel QWERTY-type thumbboard 805. In this embodiment, a screen display 815 on display portion 803 and thumbboard 805 on body portion 807 both face outward and are on opposite sides of body portion 807 when device 801 is in the closed state. As device 801 transitions to the open state, display portion 803 hingedly pivots relative to body portion 807 as indicated by arrow 809 in FIG. 6B. In the open state, display screen 815 is adjacent to and visible above thumbboard 805. As is shown, device 801 includes similar input/output ports and devices as device 601, such as LED's 823, at least one speaker 825, a plurality of joysticks 827, and an analog responder 839.

Referring now to FIGS. 7A-7D in the drawings, another alternate embodiment of the device of the present invention is illustrated. In this embodiment, a device 901 has a telescoping design. The physical configuration of device 901 corresponds to the configuration illustrated in FIGS. 3A-3C. As with previously discussed embodiments, device 901 has an always visible display screen 915. Display screen 915 is carried by a body portion 907 into which a novel, two-piece QWERTY-type thumbboard 905a and 905b telescopes into from opposing sides of body portion 907. As is shown, device 901 includes similar input/output ports and devices as device 601, such as LED's 923, at least one speaker 925, a plurality of joysticks 927, and an analog responder 939. Joysticks 923 are carried on each piece of thumbboard 905a and 905b.

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The device of the present invention has a configuration that has a relatively small overall size, but is optimized for textual and other non-voice types of communication. With advancements in radio technology, it is possible to include voice communication capability without significantly increasing the overall size of the device. In accordance with the preferred implementation of the present invention, a plurality of alternative communication modes can be supported by the device and the associated wireless network. Some communication modes can be considered to be "cold" forms of communication, while other modes of communication may be considered to be "hot" modes of communication. A cold mode of communication has a high degree of delay or latency associated therewith. Conversely, a hot mode of communication is one which has a low degree of delay or latency associated therewith. Generally, hot modes of communication may be conducted in real time, or instantaneously. Preferably, the alternative communication modes include an e-mail mode, an IM mode, a chat mode, a voice mode, and a video phone mode. The following is a description of the operation of the present invention to enable these various modes of communication as well as the escalation or de-escalation of modes of communication.

The e-mail mode of communication is one in which text messages are keyed in by one user and communicated in a text form over the wireless network to a designated recipient. The e-mail mode of communication on the network utilizes conventional e-mail formats and protocols. E-mail messages may be accumulated and saved in an electronic in-box, whereby the e-mail messages may be read at the leisure and convenience of the recipient.

The instant messaging mode of communication is one in which text messages are keyed in by one user and delivered immediately to the recipient user if the recipient user's device is in an IM receipt mode. IM messages received while in the IM receipt mode subordinate other content on the recipient's device. Thus, IM is considered "hotter" than e-mail. It is desirable that the IM mode of communication on the wireless network utilizes conventional IM formats and protocols.

The chat mode of communication is one in which a plurality of communicants have initiated a chat session in which text, graphical, or voice synthesized messages are exchanged substantially concurrently in a dialog fashion. Because the users in a chat session have affirmatively established a desire to communicate with each other, chat is "hotter" than e-mail and IM. It is desired that the chat mode of communication on the wireless network utilizes conventional chat formats and protocols.

The voice mode of communication is similar to a telephone conversation. The voice mode of communication is possible when a mobile phone is embedded in the device. Because the voice mode of communication is performed concurrently between users in real time, it is "hotter" than e-mail, IM, or chat. It is desired that the voice mode of communication on the wireless network utilizes conventional cellular or digital phone formats and protocols.

The video-voice mode of communication is similar to a video phone conversation. The video-voice mode of communication is possible when a mobile video phone is embedded in the device. Because the video-voice mode of communication is performed concurrently between users in real time, and involves current video, it is "hotter" than e-mail, IM, chat, or voice. It is desired that the video-voice mode of communication on the wireless network utilizes conventional cellular or digital video phone formats and protocols.

In accordance with the preferred embodiment of the present invention, it is possible for communicants to move

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between modes of communication from a relatively "cold" mode of communication, such as IM, to a relatively "hot" mode of communication, such as a voice. If during an IM session, the communicants decide to "switch up" to the voice communication mode, they can simply input an appropriate command to their respective devices, and the wireless network will establish the voice connection between the users.

Conversely, it is possible for communicants to de-escalate modes of communication from a relatively "hot" to a relatively "cold" mode of communication. This could be done in an effort to reduce airtime or to conserve network energy. For example, if two users are communicating to each other in the voice mode and decide to "switch down" to a chat mode which may burn less network energy, the users simply input an appropriate command to their respective devices, and the wireless network will disconnect the voice connection between the users and establish a chat session between the users.

Although the invention has been described with reference to a particular embodiment, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments as well as alternative embodiments of the invention will become apparent to persons skilled in the art upon reference to the description of the invention. It is therefore contemplated that the appended claims will cover any such modifications or embodiments that fall within the scope of the invention.

We claim:

1. A hand-held, electronic computing device having a physical configuration comprising:

a body portion;
a display portion pivotally coupled to the body portion;
a constantly visible display carried by the display portion;
an alphanumeric keyboard carried by the body portion;
wherein the alphanumeric keyboard is at least partially concealed by the display portion when not in use; and
wherein the display portion pivots relative to the body portion in a plane that is generally parallel with the alphanumeric keyboard.

2. The hand-held, electronic computing device according to claim 1, wherein the display portion completely conceals the alphanumeric keyboard.

3. The hand-held, electronic computing device according to claim 1, wherein the display portion pivots 180° relative to the body portion to define an open position.

4. The hand-held, electronic computing device according to claim 1, wherein the display portion pivots from a point located above the alphanumeric keyboard.

5. The hand-held, electronic computing device according to claim 1, wherein the display portion pivots from a point located below the alphanumeric keyboard.

6. The hand-held, electronic computing device according to claim 1, wherein the display is a high-resolution color display.

7. The hand-held, electronic computing device according to claim 1, further comprising:

at least one push pad disposed on the body portion to aid in pivoting the display portion relative to the body portion.

8. The hand-held, electronic computing device according to claim 1, further comprising:

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at least one push pad disposed on the display portion to aid in pivoting the display portion relative to the body portion.

9. The hand-held, electronic computing device according to claim 1, further comprising:

at least one protective bumper disposed on the body portion.

10. The hand-held, electronic computing device according to claim 1, further comprising:

at least one protective bumper disposed on the display portion.

11. The hand-held, electronic computing device according to claim 1, wherein the body portion is formed from a partially transparent material.

12. The hand-held, electronic computing device according to claim 1, wherein the display portion is formed from a partially transparent material.

13. The hand-held, electronic computing device according to claim 1, wherein the body portion is of modular construction to allow the interchangeability of external components.

14. The hand-held, electronic computing device according to claim 1, wherein the display portion is of modular construction to allow the interchangeability of external components.

15. The hand-held, electronic computing device according to claim 1, further comprising:

at least one input/output component from the following group:

- a. a light;
- b. an LED;
- c. a button;
- d. a joystick;
- e. a touch pad;
- f. a jog wheel;
- g. a scroll wheel;
- h. a speaker;
- i. a headphone jack;
- j. a microphone;
- k. an infrared port;
- l. a DC adapter port;
- m. an antenna;
- n. an on/off switch;
- o. an analog responder; and
- p. a conductive power terminal.

16. The hand-held, electronic computing device according to claim 15, wherein the input/output components are carried by the body portion.

17. The hand-held, electronic computing device according to claim 15, wherein the input/output components are carried by the display portion.

18. The hand-held, electronic computing device according to claim 16, wherein the input/output components are carried by both the body portion and the display portion.

19. The hand-held, electronic computing device according to claim 15, wherein the input/output components are located to facilitate interaction with the device while the display portion is positioned to partially conceal the alphanumeric keyboard.

20. The hand-held, electronic computing device according to claim 15, wherein the LED is a full-spectrum color LED.

* * * * *

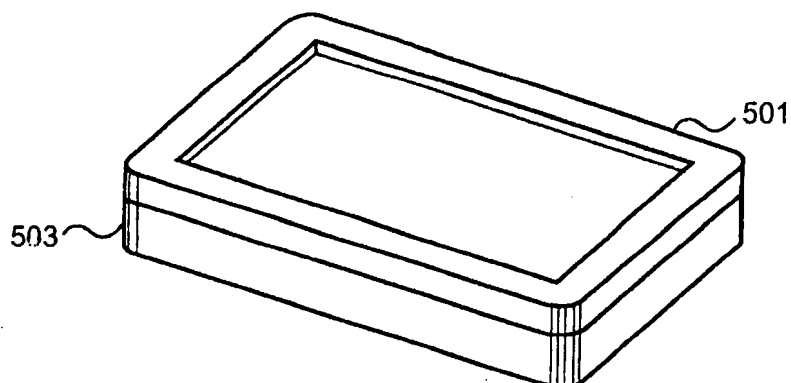


Figure 1A

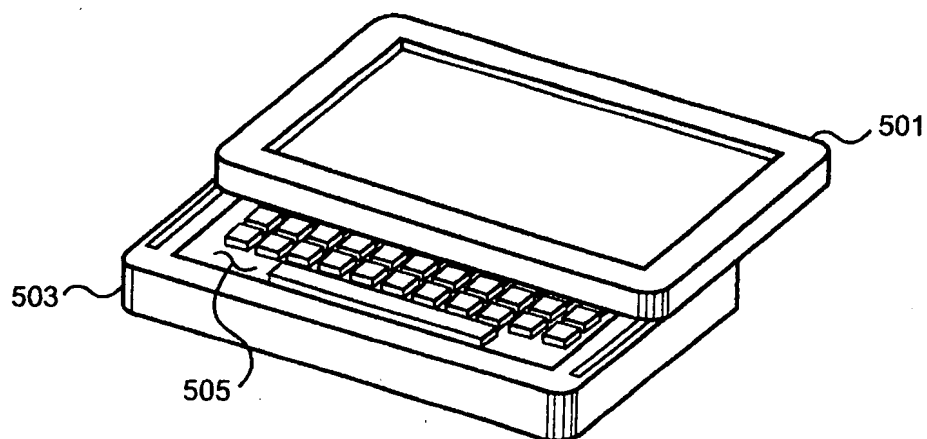


Figure 1B

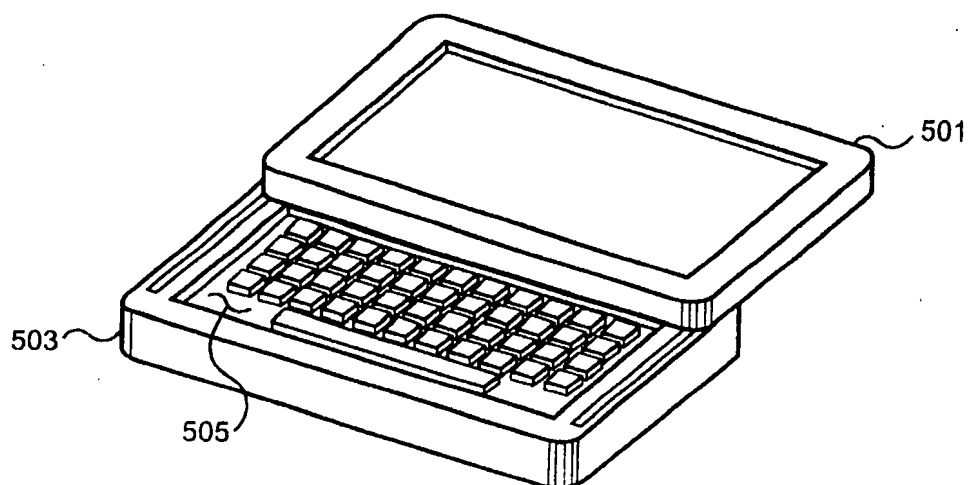


Figure 1C

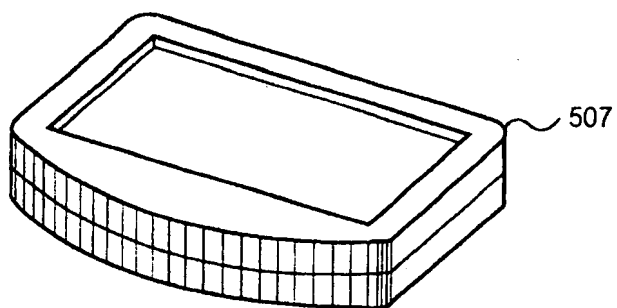


Figure 2A

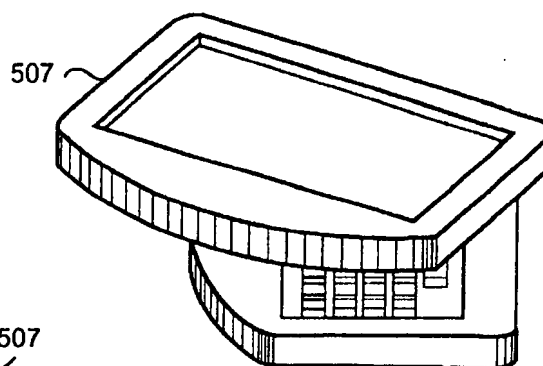


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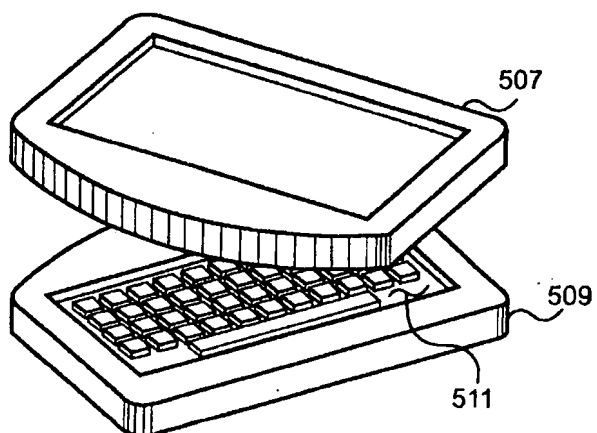


Figure 2C

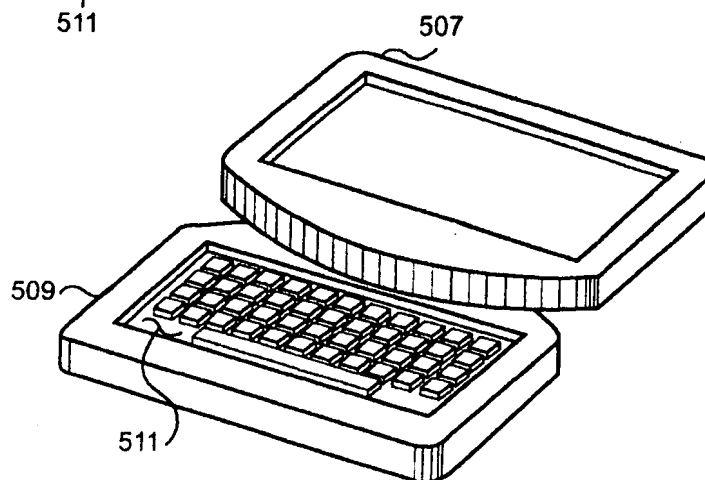


Figure 2D

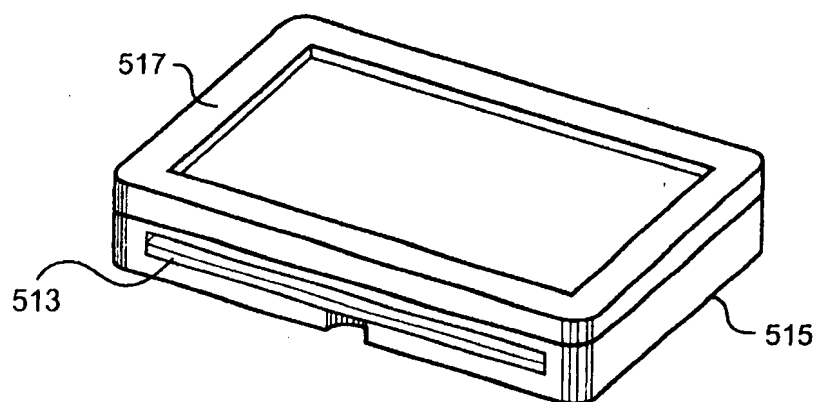


Figure 3A

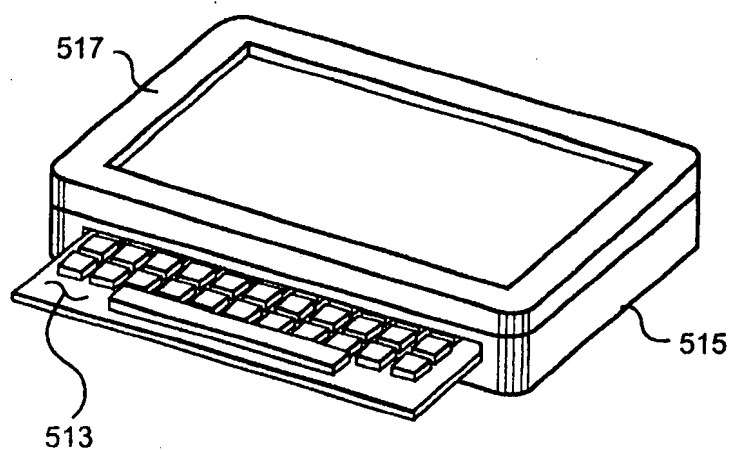


Figure 3B

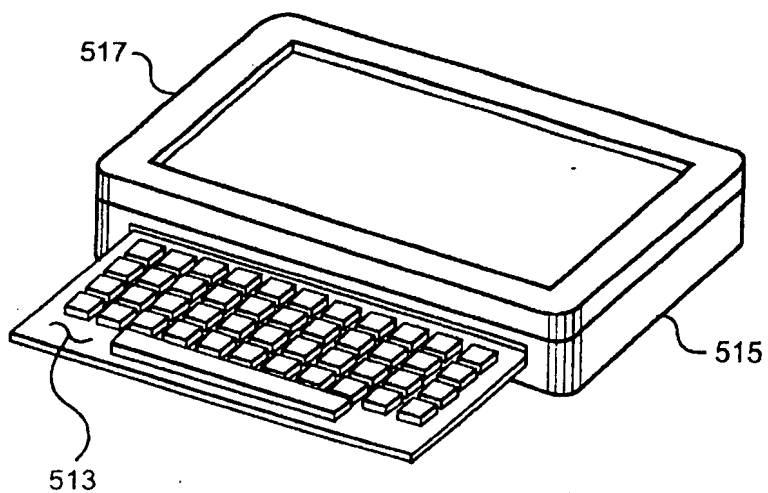


Figure 3C

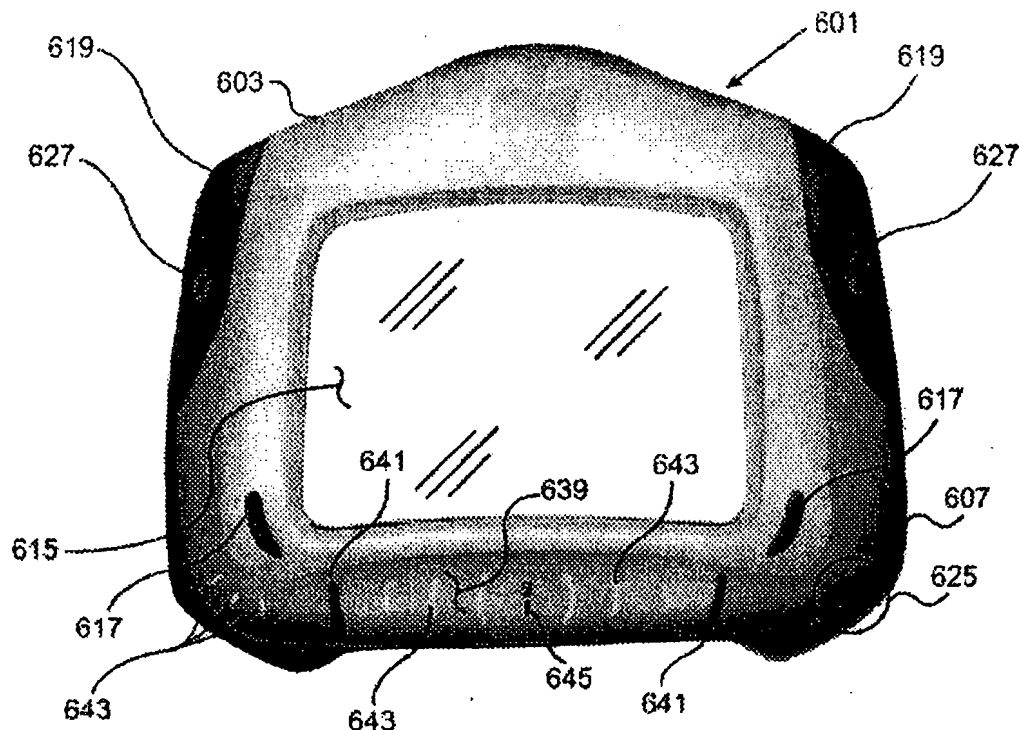


Figure 4A

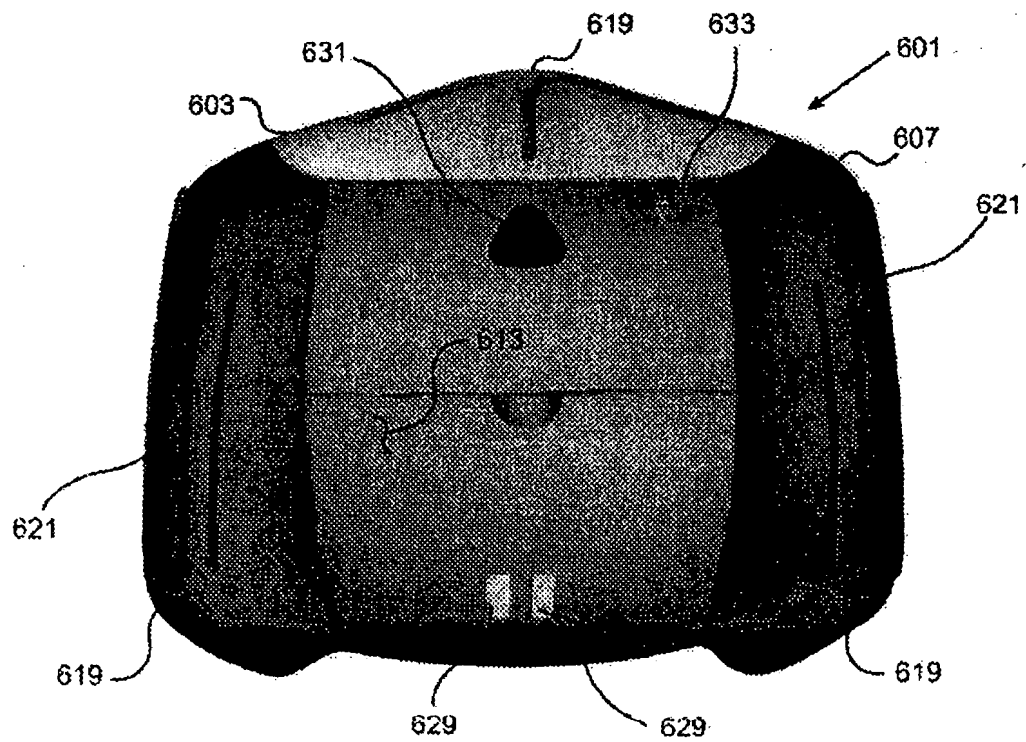


Figure 4B

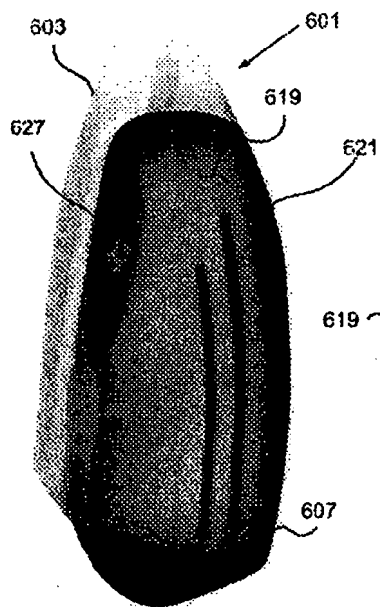


Figure 4C

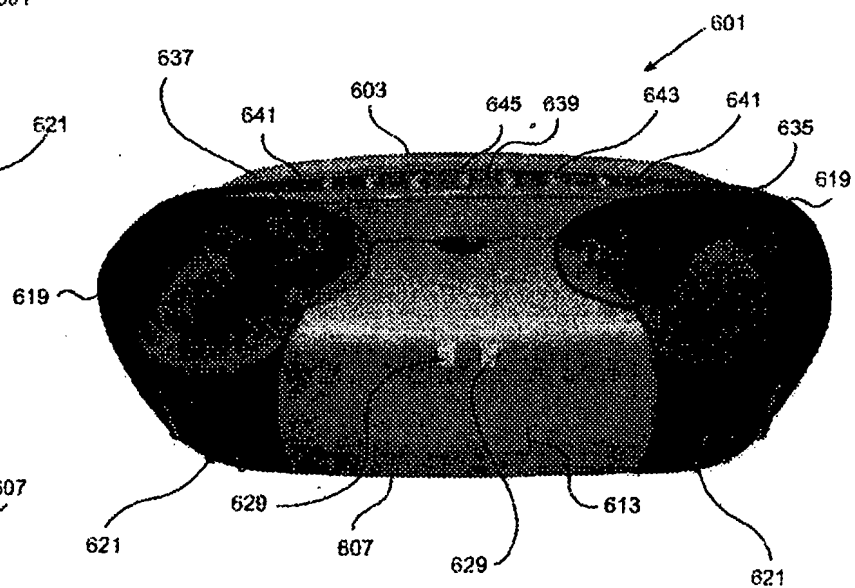


Figure 4D

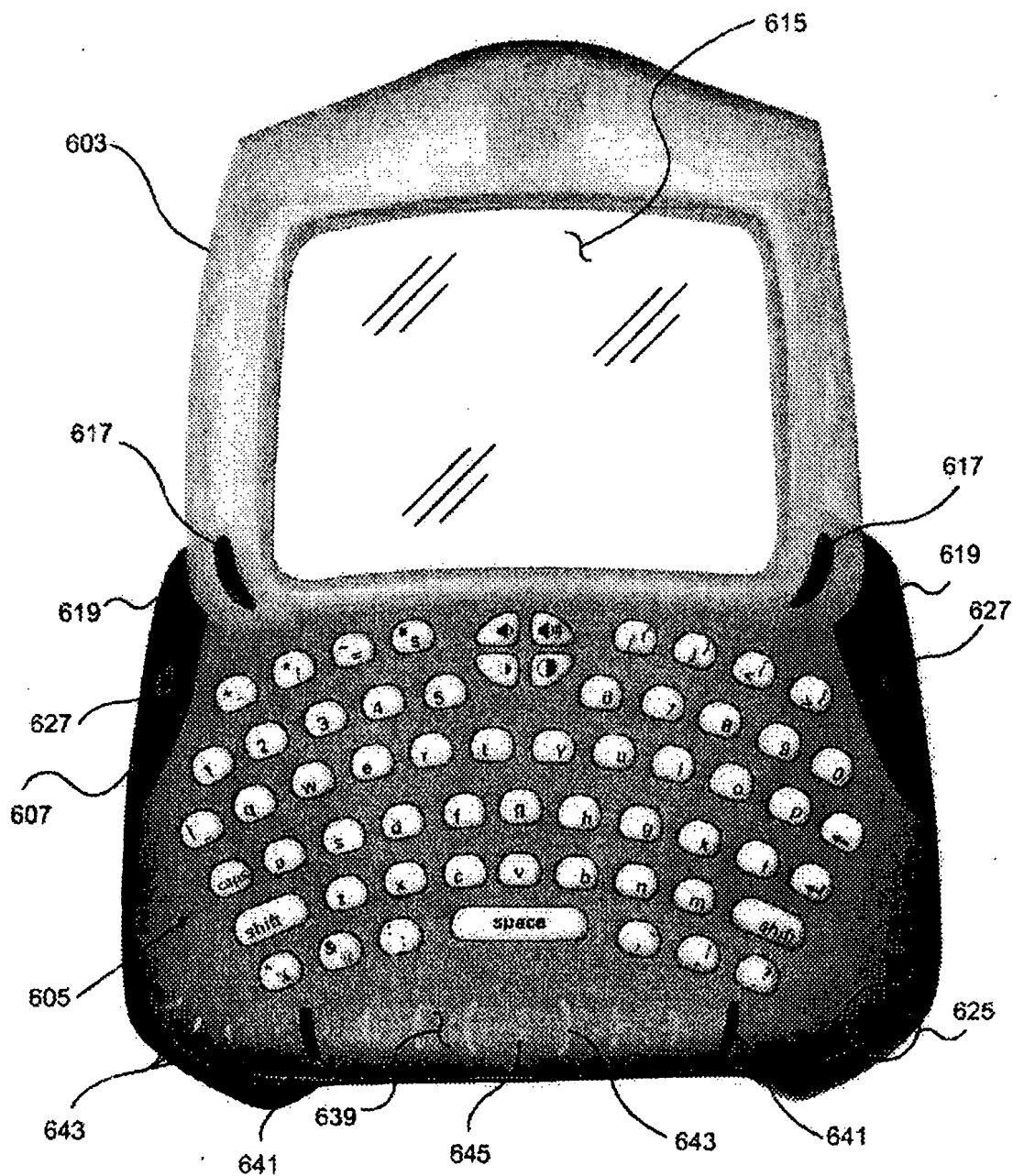


Figure 4E

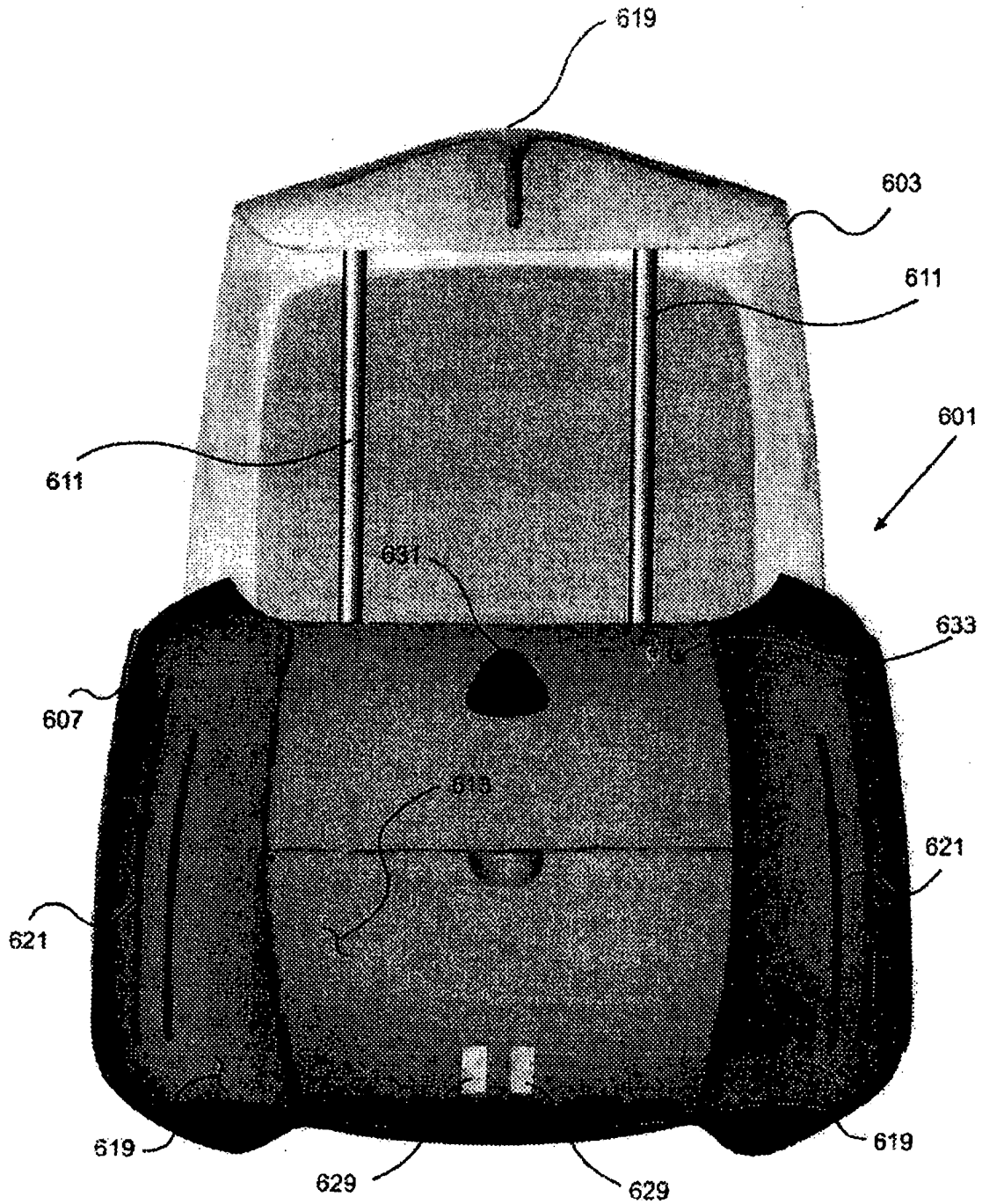
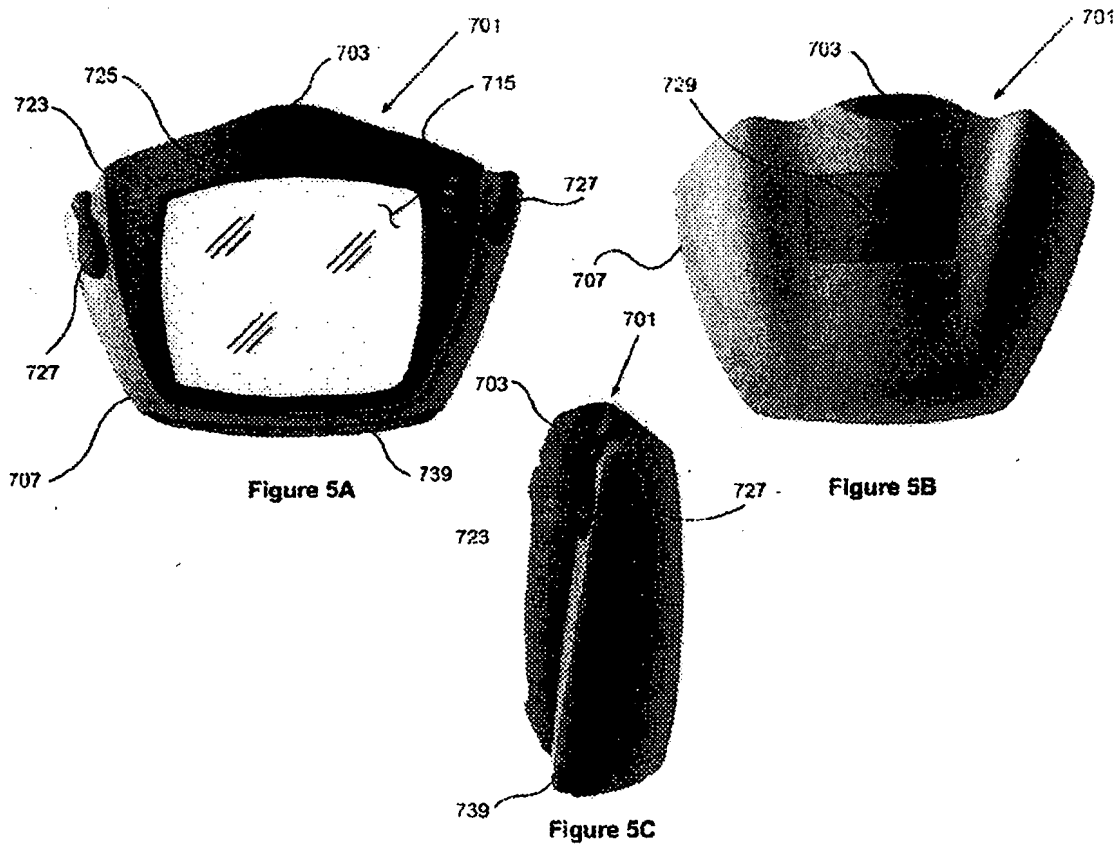


Figure 4F



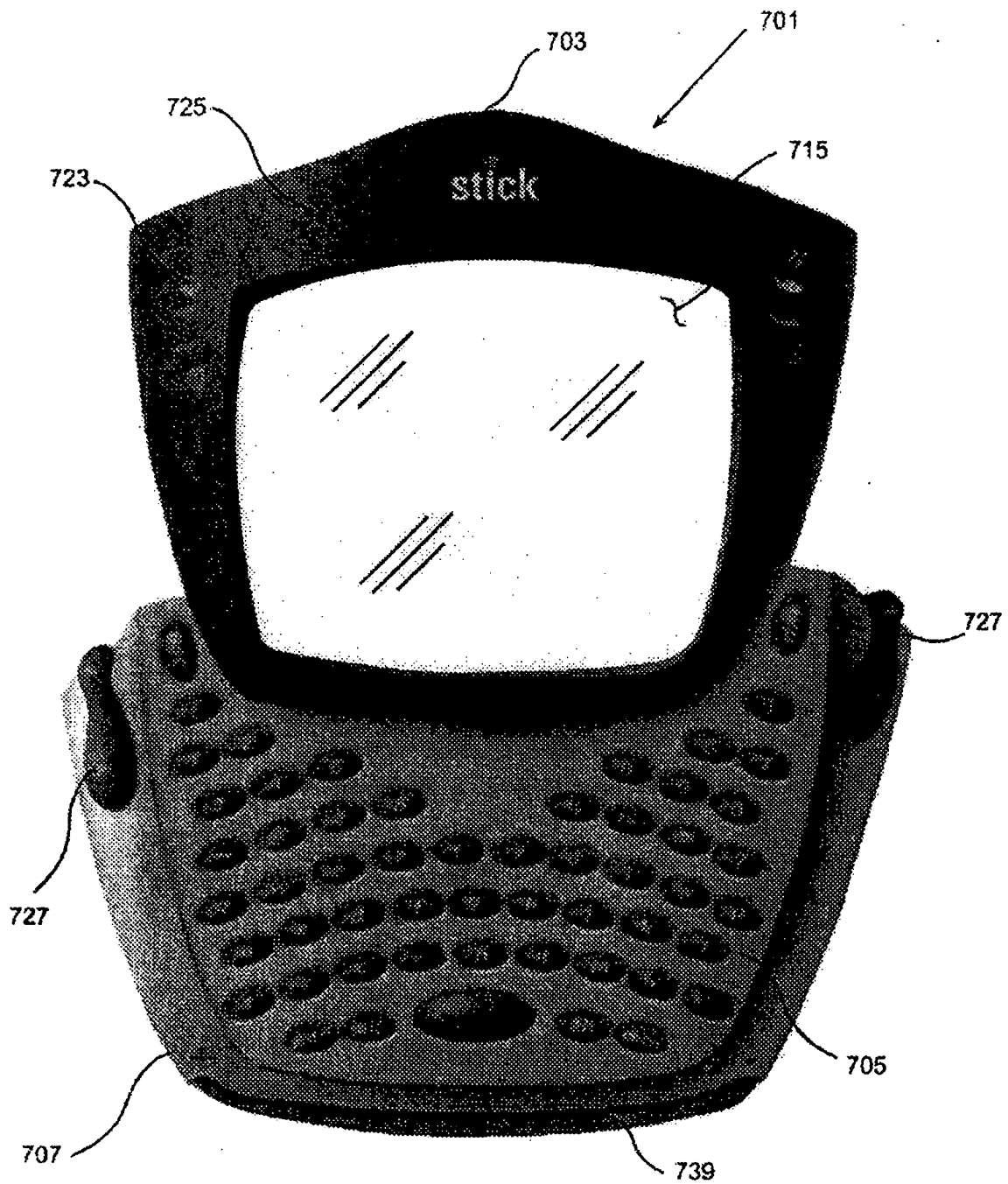


Figure 5D

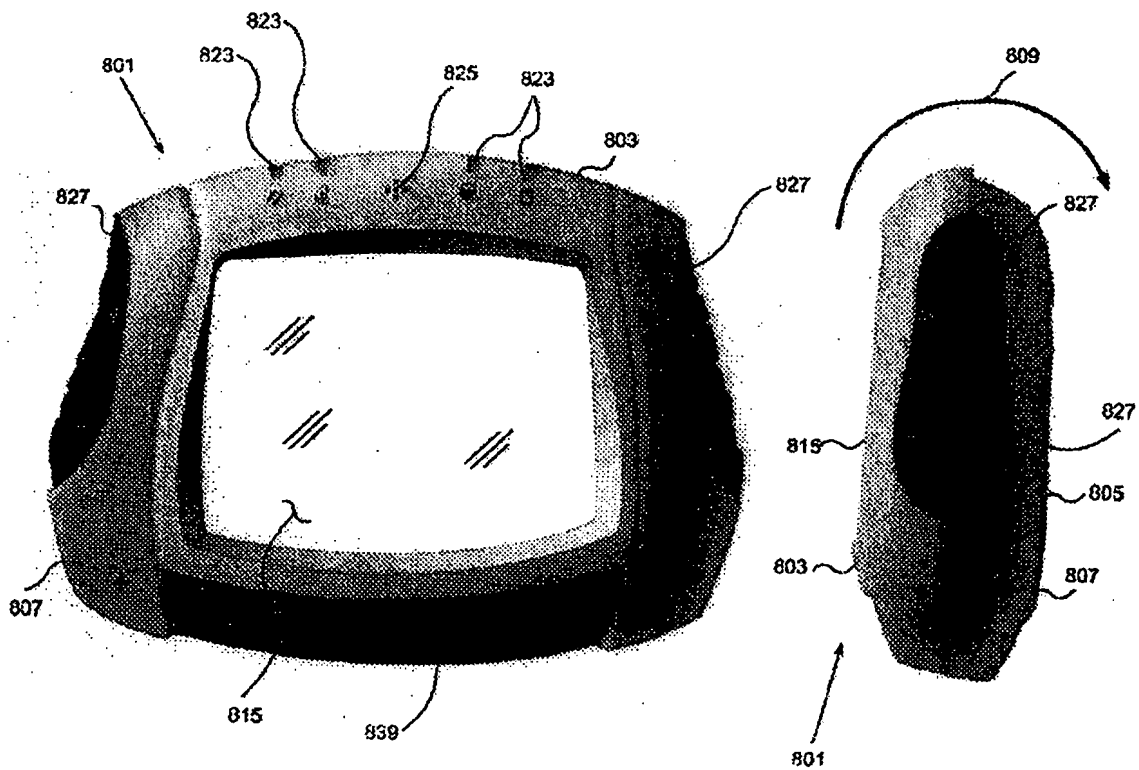


Figure 6A

Figure 6B

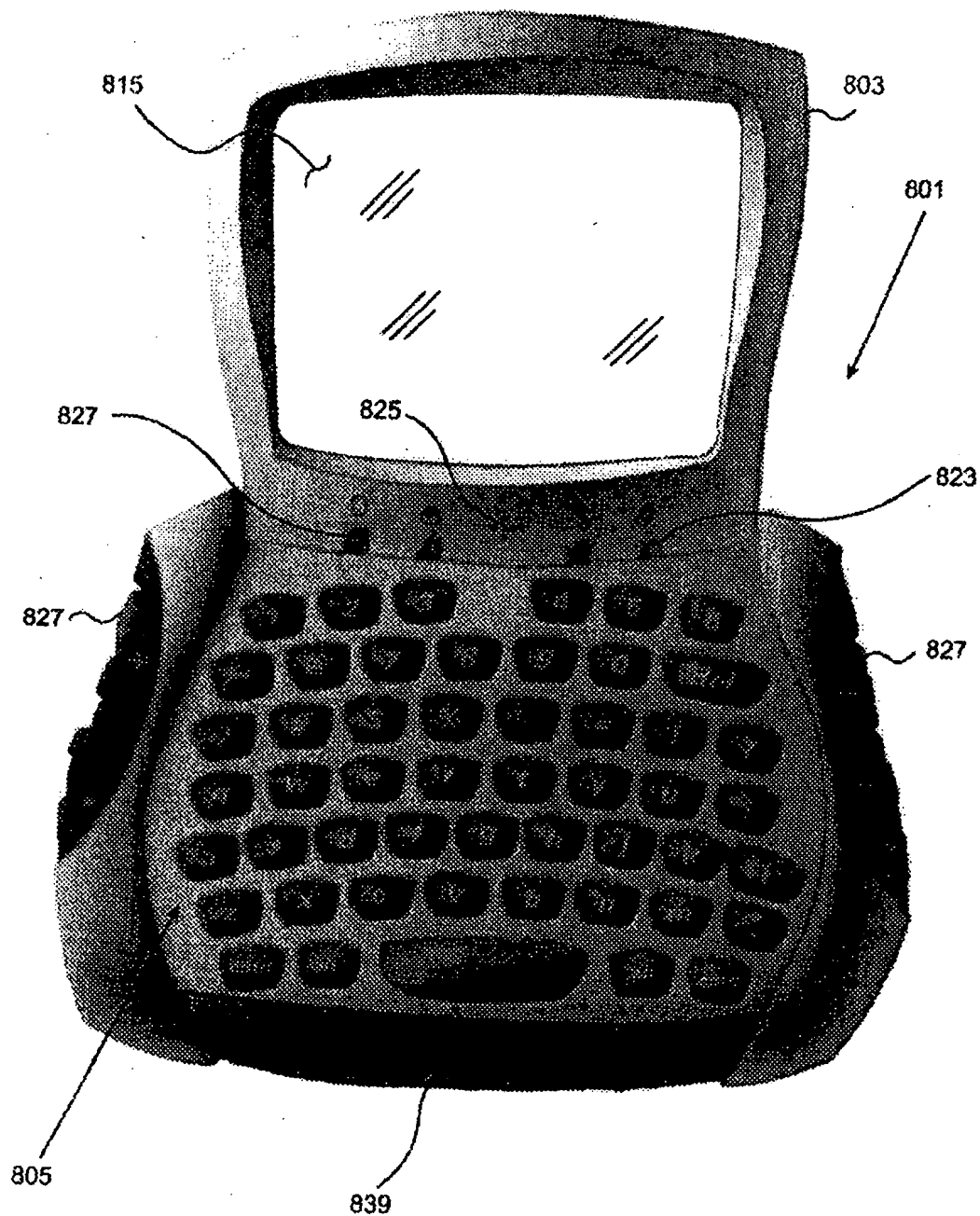


Figure 6C

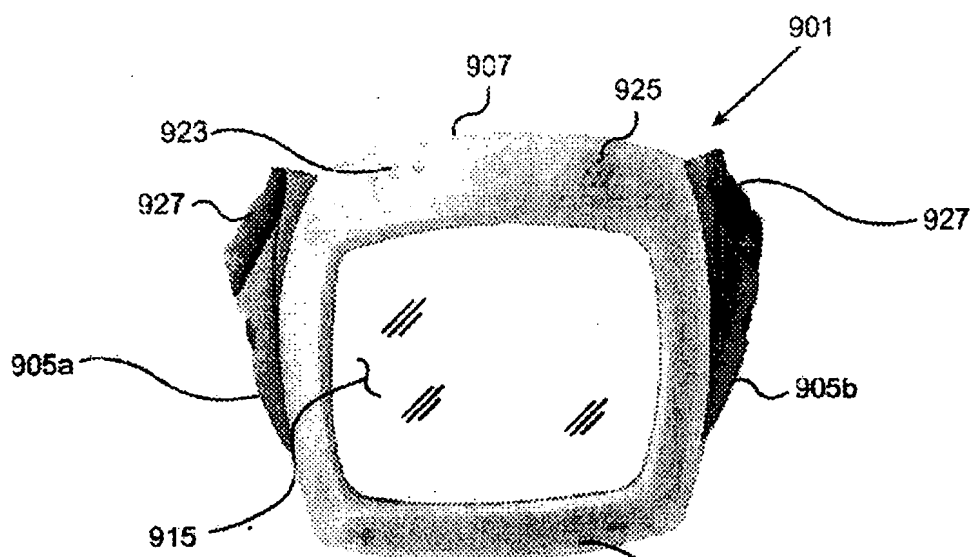


Figure 7A

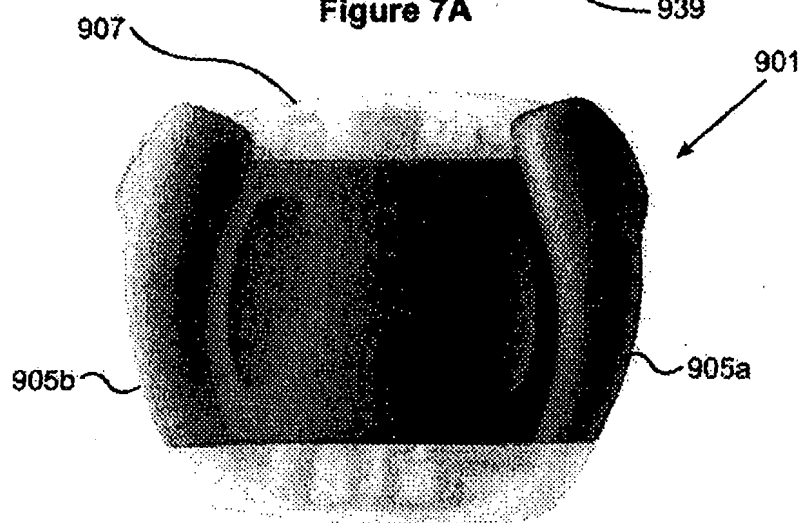


Figure 7B

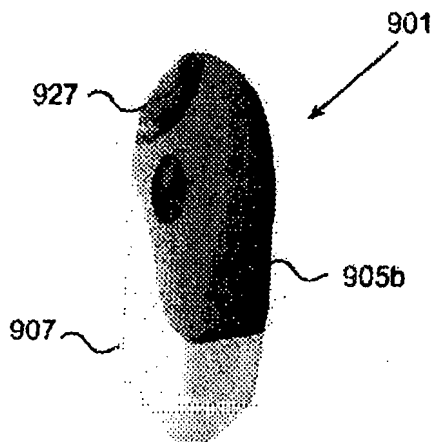


Figure 7C

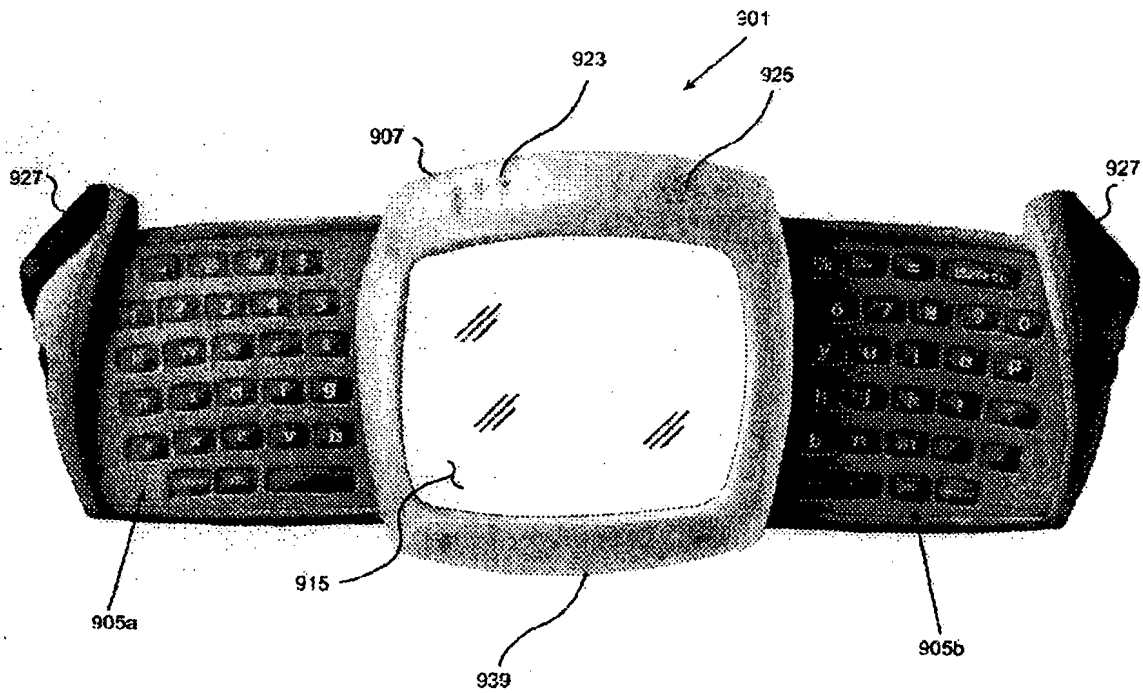


Figure 7D



Auto-Reply Facsimile Transmission

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Fax Information

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Total Pages:

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To:	DUCO DINH	From:	Delphine James
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Comment: Attached is the proposed response.

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Date: December 29, 2004
Phone:
Pages: 11
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CC: [Click here and type name]
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•Comments: Attached is the proposed response.

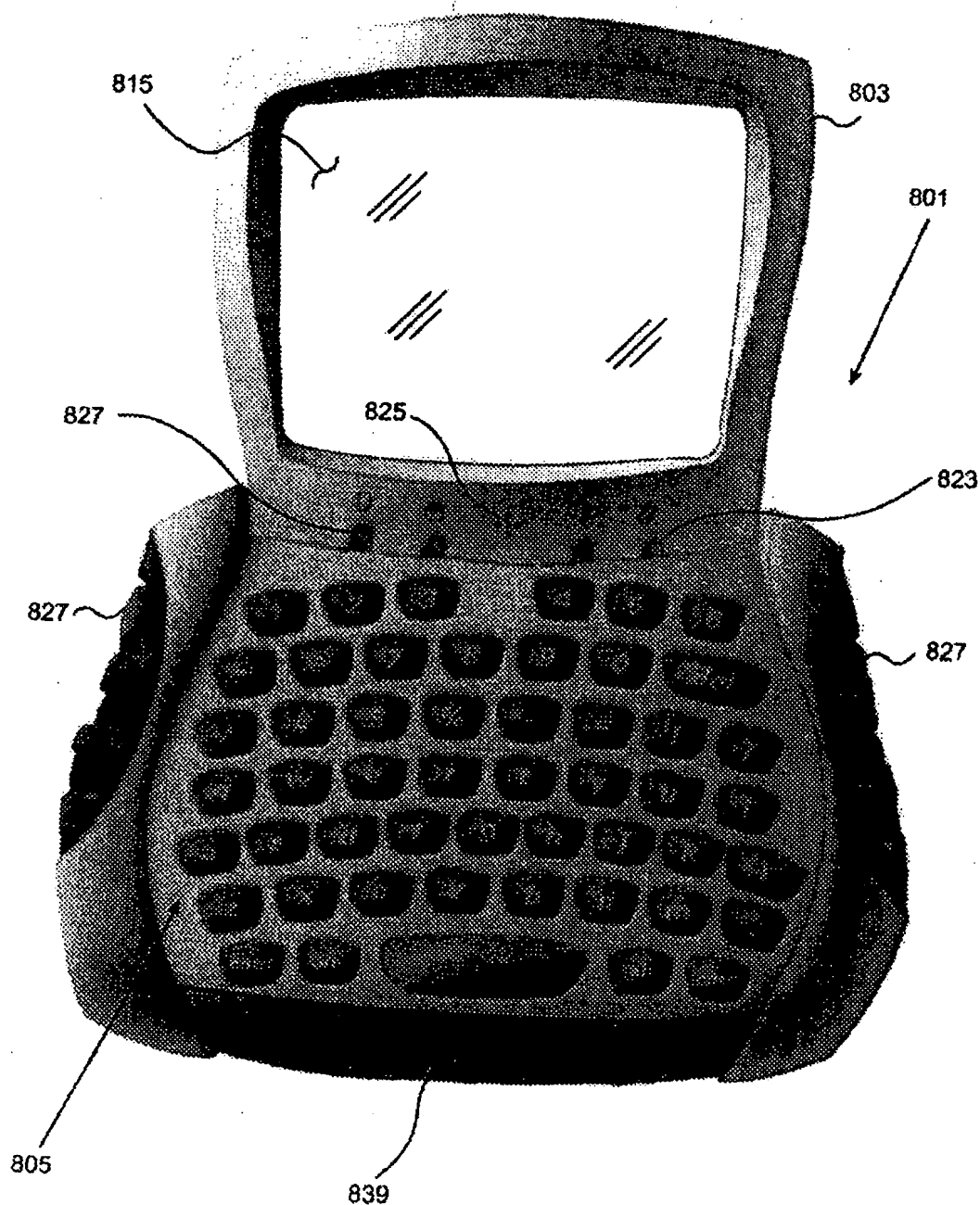


Figure 6C

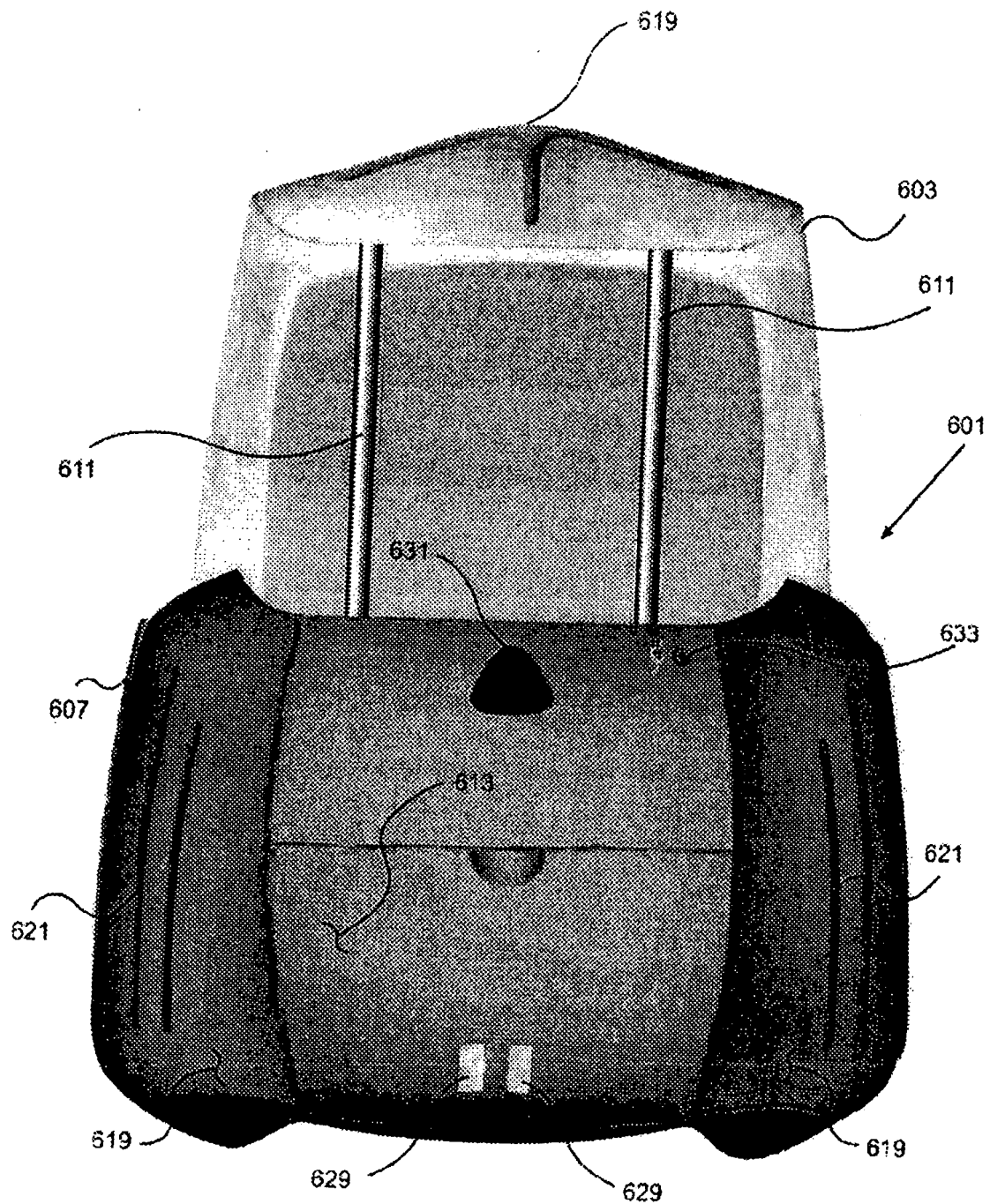


Figure 4F

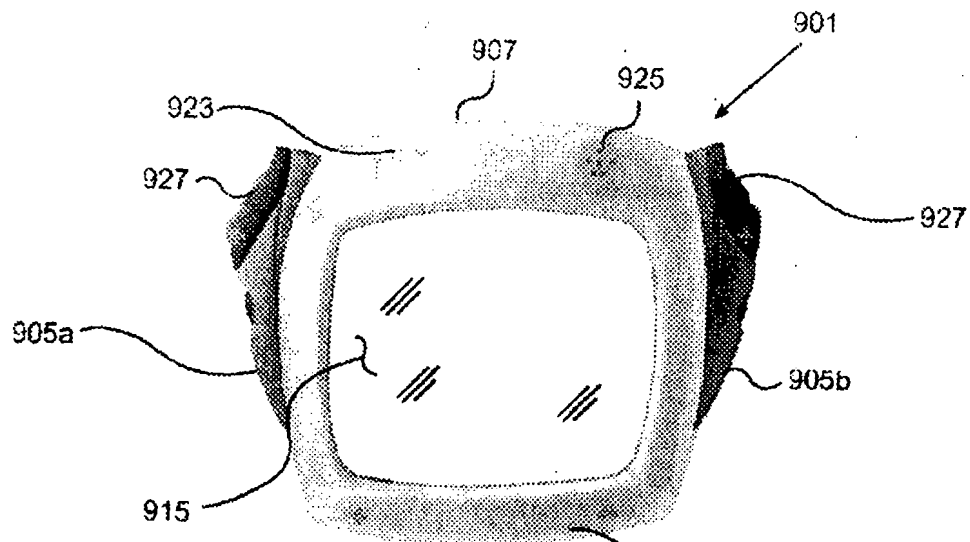


Figure 7A

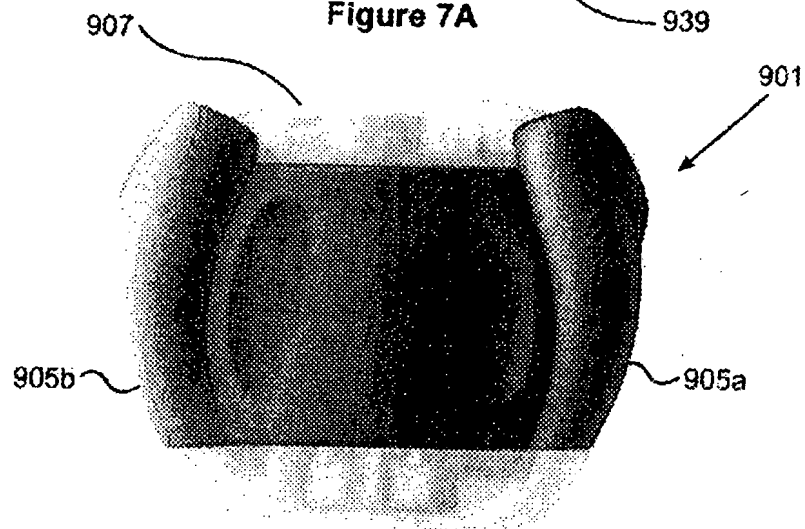


Figure 7B

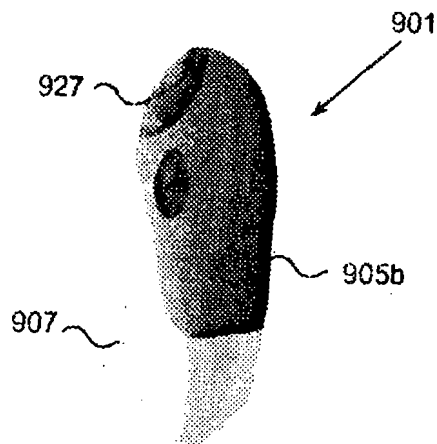


Figure 7C

(12) **United States Patent**
Brandenberg et al.

(10) Patent No.: **US 6,665,173 B2**
(45) Date of Patent: **Dec. 16, 2003**

(54) **PHYSICAL CONFIGURATION OF A HAND-HELD ELECTRONIC COMMUNICATION DEVICE**

(75) Inventors: **Carl Brock Brandenburg, Cresson, TX (US); Robert L. Kay, Fort Worth, TX (US)**

(73) Assignee: **Wireless Agents, LLC, Fort Worth, TX (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 165 days.

(21) Appl. No.: **09/745,617**

(22) Filed: **Dec. 20, 2000**

(65) **Prior Publication Data**

US 2001/0048589 A1 Dec. 6, 2001

Related U.S. Application Data

(60) Provisional application No. 60/172,675, filed on Dec. 20, 1999.

(51) Int. Cl.⁷ **G06F 1/16**

(52) U.S. Cl. **361/680; 361/683; 345/905; 349/84; 400/682; 312/223.1**

(58) Field of Search **361/679-686, 361/724-727; 345/905, 156, 169; 349/58; 312/223.1-223.2; 400/88, 682**

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e-concept Zaurus MI-E1.

* cited by examiner

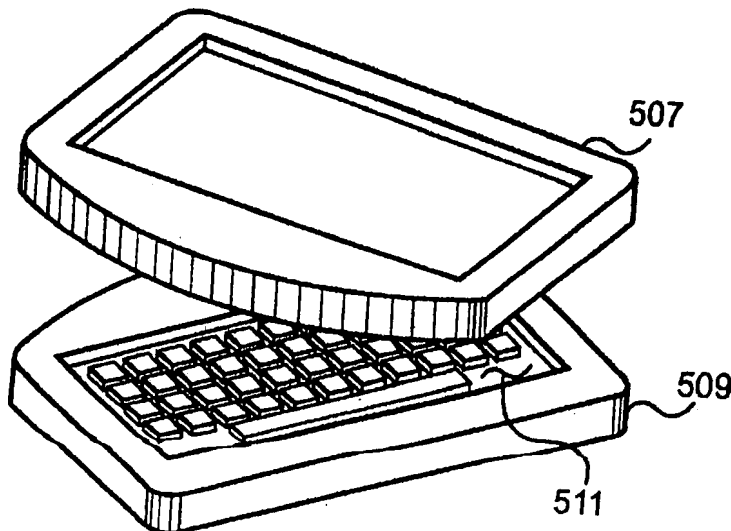
Primary Examiner—Lisa Lea-Edmonds

(74) *Attorney, Agent, or Firm*—James E. Walton; Melvin A. Hunn; Hill & Hunn LLP

(57) **ABSTRACT**

A hand-held, electronic, bi-directional, wireless electronic communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed.

20 Claims, 13 Drawing Sheets



PHYSICAL CONFIGURATION OF A HAND-HELD ELECTRONIC COMMUNICATION DEVICE

This application claims the benefit of U.S. Provisional Application No. 60/172,675, filed Dec. 20, 1999, titled "Physical Configuration of a Handheld Electronic Communication Device."

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the physical configuration of hand-held, electronic devices. In particular, the present invention relates to the physical configuration of hand-held, electronic devices capable of bi-directional, wireless data communication.

2. Background Information

Until now, hand-held, wireless devices have primarily been used for person-to-person communication by voice, transmitting and receiving voice data in real-time. These "mobile phone" devices have allowed users to go wherever they like and still be in touch with their friends and colleagues just as though they were using a wired phone at home or work. Communication by textual means, such as e-mail, has been performed almost exclusively over land-based copper and fiber optic phone lines, because the wireless communication networks have simply not had the capacity or capability to provide cost effective, wireless transmission of textual data. But recent advancements in wireless technology have made it possible to provide cost-effective data transfer over existing wireless networks.

The most common means of textual communication has been e-mail, but a relatively new form of messaging called "instant messaging" (IM) has caught on and has grown very rapidly in popularity in the last several years. Unlike e-mail which sits in an electronic mailbox until the user retrieves his or her e-mail messages, IM occurs nearly instantaneously, producing a notification and a dialog box on a user's screen alerting the user that they have an incoming message. In addition, users have the ability to know if the recipient is on-line and available to receive an IM message.

Many hand-held, wireless devices are beginning to provide access to e-mail, but their functionality is currently very limited. The user is usually limited to browsing, that is receiving and reviewing the information, not authoring and sending data. Much like retrieving voice messages from a voice mailbox, the user is only able to retrieve e-mail messages from their e-mail inbox. The primary reason for this is that authoring messages requires a convenient method of alphanumeric data entry. Users are hesitant or reluctant to enter a message if the data entry process is slow and difficult. This is a problem that conventional devices cannot properly address due to user interface limitations, i.e., the capabilities, design, and layout of the physical devices. While e-mail may require entry of a moderate length message in response to a received message, such data entry usually happens at a time the user deems appropriate and convenient, not at a time dictated by the sender of the message. This is very much like the user being able to periodically check voice messages in a voice mailbox, and respond at the user's convenience.

However, IM and other types of instantaneous textual and graphical communication are more real-time and intrusive than e-mail; the same way that an incoming phone call is more real-time and intrusive than checking voice messages. IM is a much more frequently accessed and used system than

an e-mail client; therefore, IM requires a network and device that are much more convenient to use than an e-mail client. Such a level of convenience has been possible with wired connections and desktop computers. With traditional desktop computers, the computer is placed on or near the work surface and the display and keyboard are easily accessible. The user can immediately see incoming IM messages presented on the display, then respond to the IM messages using the keyboard. The user does not have to remove a device from the user's belt clip or pocket and open the device to see the IM message. Neither does the user have to then locate a work surface for support and connect a peripheral keyboard in order to compose a response.

There are a variety of devices available that are capable of providing wireless access to textual information, such as mobile phones, personal digital assistants (PDA's), handheld computers, and two-way pagers, but the compromises in all of these designs limit their suitability as IM devices. For some of these devices, the displays are always visible and easy to see, but the device lacks an input device, has a small and inappropriate input device, has a slow and error prone method of data entry, or requires additional peripheral devices and a work surface for support. For other devices, a suitable input device is present, but the device transforms between multiple states which prevent the display from being seen in one of the states, limiting the convenience of using the device on a frequent basis.

Conventional wireless communication devices can be categorized into several distinct configurations: (1) mobile phones, commonly known as cellular phones; (2) personal digital assistants, commonly referred to as PDA's; (3) handheld computers, commonly referred to as palmtop computers; and (4) two-way pagers.

The configuration of a mobile phone typically consists of: (1) a small display that is always visible; (2) a keypad for numeric data entry; and (3) an internal communication module that can transmit and receive analog and/or digitized voice data.

The mobile phone configuration has the following disadvantages: (1) the display is typically very small and inappropriate for display of large amounts of textual data, i.e., they are typically proportioned for one or two rows of phone numbers and proper names, not textual data in the structure of a written sentence; (2) the keypad is commonly located adjacent to the display, increasing the overall size of the unit; (3) on some units, the device has a clamshell design that obscures both the keypad and display when closed; (4) the keypad is typically a twelve-digit keypad designed for numeric data entry, although the keyboard usually supports alphanumeric character entry for the purpose of entering proper names into an address book maintained in the phone's memory, whereby the commonly used method of accessing alphanumeric characters is to switch the device into a text entry mode, then press a key repeatedly to access a particular one of a subset of characters available for each key, this method being extremely slow, awkward, error prone, and not appropriate for a device intended to transfer textual data on a regular basis; and (5) the communication module is typically engineered to support voice communication, and in only the latest device versions, limited retrieval of alphanumeric data.

The configuration of a PDA typically consists of: (1) a large display that is always visible; (2) a touch screen and stylus for data entry; (3) no keyboard for data entry; and (4) no internal communication module.

The PDA configuration has the following disadvantages: (1) the device has no keyboard, so alphanumeric data entry

is usually performed in one of two ways: (a) the user taps with a hand-held stylus on a "soft" keyboard that is drawn on the display, or (b) the user writes on screen with a hand-held stylus and the processor converts the user's writing into text data; (2) an optional detachable keyboard may be available, but the keyboard usually requires a flat surface for support during use as it is tethered to the device by a cable or attaches in such a way that it will easily become detached if tilted, thus making the keyboard extremely awkward for use in one hand while on the move; and (5) the device lacks a communication module, although modules may sometimes be added, but at the expense of consuming the port available for connecting the optional keyboard to.

The configuration of a palmtop computer typically consists of: (1) a large display screen; (2) a complete keyboard; (3) a clamshell design where the display closes over the keyboard, or a flat layout where the display is located adjacent to the display; and (4) no internal communication module.

The palmtop configuration has the following disadvantages: (1) although the clamshell design affords protection to the display and keyboard when the device is closed, the clamshell design often renders the display non-visible when the device is closed, and is not adequate for frequent presentation of information to a user on the move; and (2) the relatively large size makes the device prohibitive for use as an IM device, because when a large display and keyboard are present, the device becomes inconvenient for the user to carry on a regular basis, resulting in the usability of the display and keyboard being greatly reduced.

The configuration of a two-way pager typically consists of: (1) a small display screen; (2) a small, complete keyboard; and (3) a flat layout where the keyboard is located adjacent to the display, or clamshell design where the display folds over the keyboard when closed.

The two-way pager configuration has the following disadvantages: (1) units with a flat layout have displays that are always visible, but to keep the overall device size down, the display and keyboard are reduced to minuscule dimensions which greatly reduces their usability; and (2) units with a clamshell design, render the display non-visible when the unit is closed, adding inconvenience when the user must look at the display.

The distinction between each category of devices is blurring daily, but a trend is very evident in all the previously mentioned devices. The devices are either: (1) designed primarily for voice communication and have limited alphanumeric entry capability, or a capability that is not suited to use in your hands while on the move; or (2) designed primarily for occasional retrieval and display of textual information and have a design that is very inconvenient for frequent input and viewing of data while on the move.

Some of these concepts are embodied in the following U.S. patents: U.S. Design Pat. No. Des. 416,256 issued to Griffin et al. which discloses a hand-held messaging device with keyboard; U.S. Pat. No. 5,548,478 issued to Kumar et al. which discloses a portable computing device having an adjustable hinge; U.S. Pat. No. 5,638,257 issued to Kumar et al. which discloses a combination keyboard and cover for a hand-held computer. U.S. Pat. No. 5,712,760 issued to Coulon et al. which discloses a compact foldable keyboard; and U.S. Pat. No. 5,949,408 issued to Kang et al. which discloses a dual orientation display hand-held computer. These devices either have fixed keyboards or use folding clamshell designs. As such, they are not good choices for IM and other types of instantaneous textual and graphical communication.

Although the devices, designs, and physical configurations discussed above represent great strides in the area of physical configuration of hand-held communication devices, many shortcomings remain.

SUMMARY OF THE INVENTION

There is a need for a hand-held, electronic, bi-directional, wireless communication device that 1) contains a relatively large, constantly visible display capable of rich presentation of information, 2) that contains an alphanumeric keyboard that is usable by human hands and 3) that is small enough to carry and convenient enough to use under usage conditions typically encountered with a mobile phone device.

Therefore, it is an object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion that translates relative to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard carried by the body portion, the alphanumeric keyboard being concealed by the display portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless electronic communication device having a physical configuration which includes a body portion, a display portion that pivots relative to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard carried by the body portion, the alphanumeric keyboard being concealed by the display portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion coupled to the body portion, a relatively large, constantly visible display carried by the display portion, and an alphanumeric keyboard that translates into the interior of the body portion when not in use.

It is another object of the present invention to provide a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a body portion, a display portion coupled to the body portion, a relatively large, constantly visible display carried by the display portion, and a two-piece alphanumeric keyboard that translates into the interior of the body portion when not in use.

These objects are achieved by providing a hand-held, electronic, bi-directional, wireless communication device having a physical configuration which includes a relatively large, constantly visible display and an alphanumeric keyboard that can be concealed until needed. The communication device of the present invention has a physical configuration operable between an "open" state in which the alphanumeric keyboard is visible, and a "closed" state in which the alphanumeric keyboard is concealed. This allows the information presented by the communication device to be viewable in either the open or closed state. A user can quickly and easily transform the device from the closed state to the open state with either one or two hands, while viewing

the constantly visible display without interruption. The display is larger than those used on mobile phones and can display text and graphics at a convenient size and resolution. The alphanumeric keyboard is easier and faster to use and learn than the keypads and touch screens on most mobile phones and personal digital assistants. The keyboard may be a keyboard with a layout such as the common "QWERTY" layout, but need not be limited to this particular layout. Other layouts may include the "FITALY" layout, the "Dvorak" layout or any other alphanumeric layout that includes a substantially full set of alphanumeric keys.

The present invention has many advantages over existing device configurations. Because the display is constantly visible, the user can immediately see incoming messages or communications and respond appropriately. The display is relatively large to accommodate long textual messages, graphical communications, or a combination of both. The user can quickly and easily transform the device from the closed state to the open state without his view of the display being interrupted. The full alphanumeric keyboard allows the user to quickly and easily transmit messages and other textual and graphical communications in a complete and intuitive manner without having to attach peripheral devices. The unique physical configuration of the present invention is not only effortless to learn and use, it encourages users to participate in these new forms of communication.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a perspective view of a simplified representation of the hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 1B is a perspective view of the device of FIG. 1A depicting how a constantly visible display translates relative to a body portion to expose a keyboard or other data input device that is carried by a body portion.

FIG. 1C is a perspective view of the device of FIG. 1A with the constantly visible display in a position which fully reveals the keyboard or data input device.

FIG. 2A is a perspective view of an alternate simplified representation of a hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 2B is a perspective view of the device of FIG. 2A depicting how a constantly visible display pivots relative to a body portion to reveal a keyboard or other data input device.

FIG. 2C is a perspective view of the device of FIG. 2A depicting how the constantly visible display further pivots relative to the body portion to reveal the keyboard or other data input device.

FIG. 2D is a perspective view of the device of FIG. 2A with the constantly visible display pivoted to fully reveal the keyboard or other input device.

FIG. 3A is a perspective view of an alternate simplified representation of a hand-held, electronic communication device having a physical configuration according to the present invention.

FIG. 3B is a perspective view of the device of FIG. 3A depicting how a keyboard or other data input device extends outward from the interior of a body portion.

FIG. 3C is a perspective view of the device of FIG. 3A with the keyboard or other data input device in a fully extended position.

FIG. 4A is a front view of a hand-held, electronic, bi-directional wireless communication device having a

physical configuration of the type illustrated in FIGS. 1A-1C in a closed state.

FIG. 4B is a rear view of the device of FIG. 4A.

FIG. 4C is a right side view of the device of FIG. 4A.

FIG. 4D is a bottom view of the device of FIG. 4A.

FIG. 4E is a front view of the device of FIG. 4A in an open state in which a constantly visible display is translated relative to a body portion to fully reveal a keyboard or other input device.

FIG. 4F is a rear view of the device of FIG. 4A while in the open state of FIG. 4E.

FIG. 5A is a front view of an alternate hand-held, electronic, bi-directional wireless communication device having a physical configuration of the type illustrated in FIGS. 1A-1C in a closed state.

FIG. 5B is a rear view of the device of FIG. 5A.

FIG. 5C is a right side view of the device of FIG. 5A.

FIG. 5D is a front view of the device of FIG. 5A in an open state in which a constantly visible display is translated relative to a body portion to fully reveal a keyboard or other input device.

FIG. 6A is a front view of a hand-held, electronic, bi-directional wireless communication device having a clamshell-type physical configuration in which a keyboard or other input device hingedly pivots relative to a constantly visible display.

FIG. 6B is a right side view of the device of FIG. 6A.

FIG. 6C is a front view of the device of FIG. 6A with the keyboard or other input device fully pivoted relative to the constantly visible display fully reveal the keyboard or other input device.

FIG. 7A is a front view of a hand-held, electronic, bi-directional wireless communication device having a physical configuration of the type illustrated in FIGS. 3A-3C.

FIG. 7B is a rear view of the device of FIG. 7A.

FIG. 7C is a right side view of the device of FIG. 7A.

FIG. 7D is a front view of the device of FIG. 7A with a two-piece keyboard fully extended outward from the interior of a body portion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring generally to FIGS. 1A-1C, 2A-2D, and 3A-3C in the drawings, simplified representations of a hand-held, electronic communication device having a physical configuration according to the present invention are illustrated. To be convenient for IM and other instantaneous textual and graphical communications, a device must be able to support effortless reading of incoming IM messages and rapid entry of responses. Such support minimizes the inconvenience of the intrusion of the IM message. The device should allow a minimum amount of effort to perform the tasks involved when using IM.

The device configuration of the present invention provides the following unique and distinct features:

1. A relatively large display screen capable of displaying textual and graphical information, allowing for a rich presentation of information;
2. A display screen that is always visible. If, for example, the device must transition from a closed state that is characterized by maximum portability to an open state that is characterized by maximum usability, the display

is constantly visible in each state. Users are very intolerant of a device that must be manipulated and opened in order to view the display each and every time a message or notification occurs;

3. An alphanumeric data entry means that is suitable for use with human hands without the aid of an additional pointing device such as a stylus and that is designed for rapid entry of alphanumeric data; and

4. A relatively small size which makes the device convenient for portable use and allows the device to be operated, ideally, with one or two hands.

To ensure that the device of the present invention is appropriate for mobile use, the device is small and convenient to carry and use. The device is capable of being configured in at least two distinct states that maximize both its portability and usability. One device state maintains a small footprint, whereby the device consumes a minimal amount of volume and affords a greater level of portability and concealment, herein called the "closed" state. In this closed state, the display is visible, but the keyboard is concealed to minimize space and maximize portability. A second device state affords a more efficient level of alphanumeric data entry, herein called the "open" state. In the open state, the display is visible and the keyboard is accessible to maximize usability. The device can transition from the open state to the closed state easily and with a minimum of effort, preferably with one hand. Preferably, the display translates relative to the main housing to reveal the keyboard. However, the display may either pivot or rotate relative to the housing to reveal the keyboard, or the keyboard may telescope into the interior of the housing. In the preferred embodiment, the device's display remains visible in either state, allowing the user to observe incoming messages without having to manipulate the device to transition it from one state to another, such as from closed to open.

In order to overcome the limitations of current hand-held, electronic devices that serve or can be adapted to the purpose of bi-directional, wireless communication of textual and graphical information, the present invention provides a new and improved configuration of a device that allows for the inclusion in the device of both a large, always visible display screen and an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The device of the present invention preferably has a large, color display screen capable of displaying textual and graphical information for rich presentation of information. Because the display screen is always visible and hence exposed and susceptible to damage, a cover made of either a rigid or flaccid material to afford protection may protect the display. The cover may be of a material such as a clear plastic or rubber that allows the display to remain visible even when covered. Further, the device of the present invention has an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The present invention provides a configuration such that the device can be held and operated with one or two hands in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The device of the present invention comprises at least the following components: (1) an alphanumeric data input device, such as a full QWERTY-type keyboard or thumbboard; (2) a display device, such as an LCD, LED, or LEP display screen; (3) a processor; (4) a power source, such as a battery or mechanical generator like a wind-up spring mechanism; (5) a communication module, such as a CDPD, CDMA, GSM or GPRS radio capable of wireless data

transmission and reception; and (6) a physical housing that contains these components and that consists of at least two discrete portions that may translate, rotate and/or pivot relative to one another, one portion containing a display device and one portion containing a keyboard.

The display, preferably color, is always visible as the device transitions from a closed state characterized by maximum portability to an open state characterized by maximum usability. The display may translate, rotate, or revolve relative to the main housing of the device. The display will be large enough to accommodate simultaneous textual messages, graphical displays, and graphical animations. The device and corresponding wireless network include integral support of IM and other instantaneous textual and graphical communication. The exterior layout of the device is heavily influenced by the capability to effectively utilize these types of instantaneous communication.

Although the device may be placed in an "off" state in which no power is supplied to the device, it is preferred that the device remain either in an "on" state in which the device has full functionality, or a "sleep" state in which the device may appear to the user to be off, but is, in fact, performing certain background functions. In the fully functional "on" state, the device is displaying digital content and the user is interacting with the device. In the "sleep" state, the user is not interacting with the device and the display screen on the device has cycled down and is not actively displaying digital content. In the sleep state, the display screen may be blank or may be displaying a preprogrammed graphic or image. If the device is in the sleep state and the user begins to interact with the device, or if the user receives a "hot" communication, the device immediately switches from the sleep state to the on state so that the user may fully utilize all features and functionality of the device.

The device may include a variety of additional input/output components, such as lights, LED's, buttons, joysticks, a touch pad, an analog responder, and others components which allow the user to view information and manipulate the device to a certain degree without transitioning the device to the open state.

A first device configuration is specifically depicted in FIGS. 1A-1C. A constantly visible display 501 translates relative to a body portion 503 to reveal a full QWERTY-type keyboard or other input device 505. This first device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the full keyboard or other input device; (3) the display is generally parallel with the keyboard or other input device and translates relative to the body portion such that the keyboard or other input device is revealed when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the display translates in a plane that is generally parallel to the plane of the keyboard or other input device.

A second device configuration is specifically depicted in FIGS. 2A-2D. A constantly visible display 507 pivots relative to a body portion 509 to reveal a full QWERTY-type keyboard or other input device 511. This second device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state

is constantly visible in each state. Users are very intolerant of a device that must be manipulated and opened in order to view the display each and every time a message or notification occurs;

3. An alphanumeric data entry means that is suitable for use with human hands without the aid of an additional pointing device such as a stylus and that is designed for rapid entry of alphanumeric data; and
4. A relatively small size which makes the device convenient for portable use and allows the device to be operated, ideally, with one or two hands.

To ensure that the device of the present invention is appropriate for mobile use, the device is small and convenient to carry and use. The device is capable of being configured in at least two distinct states that maximize both its portability and usability. One device state maintains a small footprint, whereby the device consumes a minimal amount of volume and affords a greater level of portability and concealment, herein called the "closed" state. In this closed state, the display is visible, but the keyboard is concealed to minimize space and maximize portability. A second device state affords a more efficient level of alphanumeric data entry, herein called the "open" state. In the open state, the display is visible and the keyboard is accessible to maximize usability. The device can transition from the open state to the closed state easily and with a minimum of effort, preferably with one hand. Preferably, the display translates relative to the main housing to reveal the keyboard. However, the display may either pivot or rotate relative to the housing to reveal the keyboard, or the keyboard may telescope into the interior of the housing. In the preferred embodiment, the device's display remains visible in either state, allowing the user to observe incoming messages without having to manipulate the device to transition it from one state to another, such as from closed to open.

In order to overcome the limitations of current hand-held, electronic devices that serve or can be adapted to the purpose of bi-directional, wireless communication of textual and graphical information, the present invention provides a new and improved configuration of a device that allows for the inclusion in the device of both a large, always visible display screen and an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The device of the present invention preferably has a large, color display screen capable of displaying textual and graphical information for rich presentation of information. Because the display screen is always visible and hence exposed and susceptible to damage, a cover made of either a rigid or flaccid material to afford protection may protect the display. The cover may be of a material such as a clear plastic or rubber that allows the display to remain visible even when covered. Further, the device of the present invention has an alphanumeric data input device that allows rapid and comfortable entry of alphanumeric data. The present invention provides a configuration such that the device can be held and operated with one or two hands in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The device of the present invention comprises at least the following components: (1) an alphanumeric data input device, such as a full QWERTY-type keyboard or thumb-board; (2) a display device, such as an LCD, LED, or LEP display screen; (3) a processor; (4) a power source, such as a battery or mechanical generator like a wind-up spring mechanism; (5) a communication module, such as a CDPD, CDMA, GSM or GPRS radio capable of wireless data

transmission and reception; and (6) a physical housing that contains these components and that consists of at least two discrete portions that may translate, rotate and/or pivot relative to one another, one portion containing a display device and one portion containing a keyboard.

The display, preferably color, is always visible as the device transitions from a closed state characterized by maximum portability to an open state characterized by maximum usability. The display may translate, rotate, or revolve relative to the main housing of the device. The display will be large enough to accommodate simultaneous textual messages, graphical displays, and graphical animations. The device and corresponding wireless network include integral support of IM and other instantaneous textual and graphical communication. The exterior layout of the device is heavily influenced by the capability to effectively utilize these types of instantaneous communication.

Although the device may be placed in an "off" state in which no power is supplied to the device, it is preferred that the device remain either in an "on" state in which the device has full functionality, or a "sleep" state in which the device may appear to the user to be off, but is, in fact, performing certain background functions. In the fully functional "on" state, the device is displaying digital content and the user is interacting with the device. In the "sleep" state, the user is not interacting with the device and the display screen on the device has cycled down and is not actively displaying digital content. In the sleep state, the display screen may be blank or may be displaying a preprogrammed graphic or image. If the device is in the sleep state and the user begins to interact with the device, or if the user receives a "hot" communication, the device immediately switches from the sleep state to the on state so that the user may fully utilize all features and functionality of the device.

The device may include a variety of additional input/output components, such as lights, LED's, buttons, joysticks, a touch pad, an analog responder, and others components which allow the user to view information and manipulate the device to a certain degree without transitioning the device to the open state.

A first device configuration is specifically depicted in FIGS. 1A-1C. A constantly visible display 501 translates relative to a body portion 503 to reveal a full QWERTY-type keyboard or other input device 505. This first device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the full keyboard or other input device; (3) the display is generally parallel with the keyboard or other input device and translates relative to the body portion such that the keyboard or other input device is revealed when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the display translates in a plane that is generally parallel to the plane of the keyboard or other input device.

A second device configuration is specifically depicted in FIGS. 2A-2D. A constantly visible display 507 pivots relative to a body portion 509 to reveal a full QWERTY-type keyboard or other input device 511. This second device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state

to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

A third device configuration is specifically depicted in FIGS. 3A-3C. An input device 513 translates into a body portion 515 which carries an always visible display 517. This third device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the keyboard display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

Regardless of the configuration chosen, the device is a hand-held device that can be held by one or two hands and conveniently carried or worn by the user on his or her person. The device is operated in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The preferred configuration of a device 601 according to the present invention is illustrated in FIGS. 4A-4F. The physical configuration of device 601 corresponds to the configuration illustrated in FIGS. 1A-1C. In FIGS. 4A-4D, device 601 is shown in the closed state in which an always visible display portion 603 conceals a novel QWERTY-type thumbboard 605 that is carried by a body portion 607. In FIGS. 4E and 4F, device 601 is shown in an open state in which display portion 603 has been translated relative to body portion 607 to reveal thumbboard 605. As is best seen in FIG. 4F, display portion 603 may include a plurality of rigid support rails 611 that telescope into body portion 607 to provide additional support of display portion 603 while device 601 is in the open state. It should be understood that other support means, such as interlocking grooves on display portion 603 and body portion 607 may also be used to provide additional support for display portion 603. Display portion 603 is dimensioned to house a plurality of components (not shown). Such components may or may not be directly related to the display of images, such as a GPS antenna and integrated circuit boards. Likewise, body portion 607 is dimensioned to house a plurality of electronic components and systems and necessary integrated circuit boards, such as the microprocessor (not shown) and cache memory (not shown).

Display portion 603 includes a display screen 615. Display screen 615 is preferably a high-resolution, 16-bit color, reflective LCD screen being 320x240 pixels having a diagonal display area of about 3.8 inches. It should be understood that other comparable display screens may be used. Although always visible, display screen 615 will cycle down to a "power save" mode during periods of non-use to conserve power. A cover or shade (not shown) may be utilized to protect display screen 615 from damage, to enhance visibility, to prevent glare, or to alleviate or minimize other common problems associated with such display screens. In the preferred embodiment, display screen 615 is covered by a protective bezel (not shown).

Device 601 is powered by a portable power supply (not shown), such as batteries. In this regard, a power supply cover 613 is provided to cover and protect the portable power supply. In the preferred embodiment, the portable power supply is rechargeable by placing device 601 in a docking station or charging station (not shown). Although device 601 operates on DC current, device 601 may be plugged into and powered by a conventional 110-Volt wall

outlet (not shown) with the use of a conventionally functioning AC to DC power transformer (not shown).

A plurality of push pads 617 are located at selected locations on display portion 603. Push pads 617 are preferably located such that the user may translate display portion 603 relative to body portion 607 by pushing on push pads 617 with his thumb or thumbs. In the preferred embodiment, display portion 603 is preferably made of rigid, molded plastic or similar material. Body portion 607 is preferably made of a similar material. As has become popular in recent years, display portion 603 and/or body portion 607 may be partially transparent or translucent, having a colored tint. A plurality of protective bumpers 619, preferably made of rubber or rubberized plastic, are coupled to display portion 603 and body portion 607 at selected locations. A plurality of raised grips 621 may be integrated into protective bumpers 619 to facilitate handling of and interaction with device 601. Device 601 may be of modular construction so that a plurality of the external components may be quickly and easily interchanged. Such interchangeability allows the user to choose from a wide variety of exterior styles and designs, thereby customizing device 601 to the user's particular tastes. In this manner, the appearance of device 601 can be modified to suit the user's ever changing moods and attitudes.

Device 601 includes a plurality of input/output devices, such as LED's 623, at least one speaker 625, a plurality of joysticks 627, conductive power terminals 629 for attachment to the docking station, an infrared (IR) port 631 for the transfer of data, a DC adapter port 633 for attachment of the power transformer, a headphone jack 635 for use with headphone speakers, an on-off switch 637 for toggling device between an "on" state, an "off" state, and/or a "standby" state, as further explained herein, and an analog responder 639. It will be appreciated that LED's 623, joysticks 627, and on-off switch 637 may be multifunctional. For instance, LED's 623 are preferably full-spectrum color LED's that can be selectively programmed by the user to display selected colors at selected intensities and/or selected flash frequencies in response to certain conditions. LED's 623 are particularly useful when display screen 615 has cycled down into the power save mode. This allows the user to interact with device 601 without transitioning device into the open state. By using only LED's 623, speaker 625, joysticks 627, IR port 631, and analog responder 639, a user can perform a considerable amount of input/output without transitioning device 601 into the open state.

Analog responder 639 is a one-dimensional, electronic touch pad disposed within device 601. Analog responder 639 is activated by the user touching selected areas of device 601. Preferably, analog responder 639 is disposed within and centrally located along a lower edge of body portion 607 closest to the user. Such location allows analog responder 639 to be usable when device 601 is either in the closed state or the open state, i.e., when display portion 603 is translated relative to body portion 607. It is preferred that analog responder 639 be adjacent or in close proximity to display screen 615, because analog responder 639 functions primarily to manipulate a cursor or graphical images being displayed on display screen 615. The one-dimensional functional boundaries of analog responder 639 are preferably indicated by raised end ridges 641 or similar visual indicia. For example, one boundary may be indicated by a "-" sign and the opposing end boundary may be indicated by a "+" sign. Such indicia are particularly useful because a primary function of analog responder 639 is to allow the user to

to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

A third device configuration is specifically depicted in FIGS. 3A-3C. An input device 513 translates into a body portion 515 which carries an always visible display 517. This third device configuration includes the following features: (1) the display remains visible when the device is in either the open or closed state; (2) in the closed state, the keyboard display remains visible, but obscures the input device; (3) the input device is movable such that it is revealed from below the display when the device is transitioned from the closed state to the open state; and (4) when transitioning from the closed state to the open state, the input device moves in one or a combination of a sliding, hinging, or pivoting movements.

Regardless of the configuration chosen, the device is a hand-held device that can be held by one or two hands and conveniently carried or worn by the user on his or her person. The device is operated in a convenient and comfortable manner under usage conditions typically encountered with a mobile phone device.

The preferred configuration of a device 601 according to the present invention is illustrated in FIGS. 4A-4F. The physical configuration of device 601 corresponds to the configuration illustrated in FIGS. 1A-1C. In FIGS. 4A-4D, device 601 is shown in the closed state in which an always visible display portion 603 conceals a novel QWERTY-type thumbboard 605 that is carried by a body portion 607. In FIGS. 4E and 4F, device 601 is shown in an open state in which display portion 603 has been translated relative to body portion 607 to reveal thumbboard 605. As is best seen in FIG. 4F, display portion 603 may include a plurality of rigid support rails 611 that telescope into body portion 607 to provide additional support of display portion 603 while device 601 is in the open state. It should be understood that other support means, such as interlocking grooves on display portion 603 and body portion 607 may also be used to provide additional support for display portion 603. Display portion 603 is dimensioned to house a plurality of components (not shown). Such components may or may not be directly related to the display of images, such as a GPS antenna and integrated circuit boards. Likewise, body portion 607 is dimensioned to house a plurality of electronic components and systems and necessary integrated circuit boards, such as the microprocessor (not shown) and cache memory (not shown).

Display portion 603 includes a display screen 615. Display screen 615 is preferably a high-resolution, 16-bit color, reflective LCD screen being 320x240 pixels having a diagonal display area of about 3.8 inches. It should be understood that other comparable display screens may be used. Although always visible, display screen 615 will cycle down to a "power save" mode during periods of non-use to conserve power. A cover or shade (not shown) may be utilized to protect display screen 615 from damage, to enhance visibility, to prevent glare, or to alleviate or minimize other common problems associated with such display screens. In the preferred embodiment, display screen 615 is covered by a protective bezel (not shown).

Device 601 is powered by a portable power supply (not shown), such as batteries. In this regard, a power supply cover 613 is provided to cover and protect the portable power supply. In the preferred embodiment, the portable power supply is rechargeable by placing device 601 in a docking station or charging station (not shown). Although device 601 operates on DC current, device 601 may be plugged into and powered by a conventional 110-Volt wall

outlet (not shown) with the use of a conventionally functioning AC to DC power transformer (not shown).

A plurality of push pads 617 are located at selected locations on display portion 603. Push pads 617 are preferably located such that the user may translate display portion 603 relative to body portion 607 by pushing on push pads 617 with his thumb or thumbs. In the preferred embodiment, display portion 603 is preferably made of rigid, molded plastic or similar material. Body portion 607 is preferably made of a similar material. As has become popular in recent years, display portion 603 and/or body portion 607 may be partially transparent or translucent, having a colored tint. A plurality of protective bumpers 619, preferably made of rubber or rubberized plastic, are coupled to display portion 603 and body portion 607 at selected locations. A plurality of raised grips 621 may be integrated into protective bumpers 619 to facilitate handling of and interaction with device 601. Device 601 may be of modular construction so that a plurality of the external components may be quickly and easily interchanged. Such interchangeability allows the user to choose from a wide variety of exterior styles and designs, thereby customizing device 601 to the user's particular tastes. In this manner, the appearance of device 601 can be modified to suit the user's ever changing moods and attitudes.

Device 601 includes a plurality of input/output devices, such as LED's 623, at least one speaker 625, a plurality of joysticks 627, conductive power terminals 629 for attachment to the docking station, an infrared (IR) port 631 for the transfer of data, a DC adapter port 633 for attachment of the power transformer, a headphone jack 635 for use with headphone speakers, an on-off switch 637 for toggling device between an "on" state, an "off" state, and/or a "standby" state, as further explained herein, and an analog responder 639. It will be appreciated that LED's 623, joysticks 627, and on-off switch 637 may be multifunctional. For instance, LED's 623 are preferably full-spectrum color LED's that can be selectively programmed by the user to display selected colors at selected intensities and/or selected flash frequencies in response to certain conditions. LED's 623 are particularly useful when display screen 615 has cycled down into the power save mode. This allows the user to interact with device 601 without transitioning device into the open state. By using only LED's 623, speaker 625, joysticks 627, IR port 631, and analog responder 639, a user can perform a considerable amount of input/output without transitioning device 601 into the open state.

Analog responder 639 is a one-dimensional, electronic touch pad disposed within device 601. Analog responder 639 is activated by the user touching selected areas of device 601. Preferably, analog responder 639 is disposed within and centrally located along a lower edge of body portion 607 closest to the user. Such location allows analog responder 639 to be usable when device 601 is either in the closed state or the open state, i.e., when display portion 603 is translated relative to body portion 607. It is preferred that analog responder 639 be adjacent or in close proximity to display screen 615, because analog responder 639 functions primarily to manipulate a cursor or graphical images being displayed on display screen 615. The one-dimensional functional boundaries of analog responder 639 are preferably indicated by raised end ridges 641 or similar visual indicia. For example, one boundary may be indicated by a "-" sign and the opposing end boundary may be indicated by a "+" sign. Such indicia are particularly useful because a primary function of analog responder 639 is to allow the user to

Office Action Summary

Application No.

09/940,210

Applicant(s)

LEE, SANG MIN

Examiner

FRANCIS NGUYEN

Art Unit

2674

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) NONE is/are allowed.
- 6) ☒ Claim(s) 1.3-7.9-13 and 15-18 is/are rejected.
- 7) ☐ Claim(s) 2.8 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Application/Control Number: 09/940,210
Art Unit: 2674

DETAILED ACTION

Claim Objections

1. Claims 4, 10, 16 are objected to because of the following informalities: incorrect word "Crystals" in claim 4(page 4, line 5), claim 10(page 13, line 16), claim 16 (page 14, line 29).
Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-7, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genest et al. (US Patent 6,480,377) in view of Price et al. (US Patent 6,377,444).

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1 (original)
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As to claim 1) Genesis et al. teaches a handheld computerized device (handheld computer 12 shown in figure 1, column 7, lines 50-54) comprising:
a keyboard portion having a support base and a keypad (keyboard 20 and support base shown in figure 1, column 7, lines 34-36, plurality of individual keys 58 shown in figure 3),
an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges, the front edge of the electronic housing being hingedly coupled to the front edge of the support base (housing of handheld computer 12 shown in figure 1, hinge structure 17, column 7, lines 15-16)

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a pair of hand support means (latch hook 60 and hook receiving member 62, column 14, lines 28-32)

a means for displaying data (screen 32, column 8, lines 12-14)

a processor situated within the electronic housing (computer processor 30, column 8, lines 1-3)

However, Genest et al. fails to teach electronic housing pivot from a closed position into an open position wherein the bottom surface of the electronic housing is parallel to the bottom surface of the support base. Price et al. teaches hinged housings for electronic devices (see abstract), with first body portion and second body portion for rotation at an angle greater than 180 degrees from the mounting surface (column 3, lines 15-18) . It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Genest et al. then modify the electronic housing to pivot from a closed position to an open position for more than 180 degrees as taught by Price et al. to obtain the apparatus Genest et al. modified by Price et al. because it would allow user to have multiple configurations , as taught by Price et al. (column 5, lines 35-36).

*Teaches rotating → (affixed)
into multiple
config. into a
configuration*

As to claim 3, the device recited in claim 1, wherein the display means further comprises: a display area defined by a top edge, bottom edge, and a pair of side edges (Genest et al., screen 32, column 8, lines 3-4) ; a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and each edge of the display lying adjacent to and being securely attached to each corresponding strip of the display area (inherent on front side 26 shown on figure 1, for supporting LCD screen 32).

As to claim 4, the device recited in claim 3 wherein the display area is a Liquid Crystal Display (Genest et al., column 8, lines 13-14).

As to claim 5, the device recited in claim 3, wherein the bottom strip and each side strip of the front panel further comprises a plurality of alphanumeric keys (Genest et al., keys 58 and switches 56, column 11, lines 7-8) each adapted to generate a character signal upon depression thereof; and a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor (data port and data connector, column 11, lines 13-15) .

As to claim 6, the device recited in claim 1, further comprising a pressure sensitive writing means for allowing data to be inputted via handwriting (Genest et al., column 8, lines 15-17 column 11, lines 58-64).

As to claim 7, Genesis et al. teaches a handheld computerized device (handheld computer 12 shown in figure 1, column 7, lines 50-54) comprising:
a keyboard portion having a support base and a keypad (keyboard 20 and support base shown in figure 1, column 7, lines 34-36) plurality of individual keys 58 shown in figure 3),
an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges (housing of handheld computer 12 shown in figure 1)

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a pair of hand support means (latch hook 60 and hook receiving member 62, column 14, lines 28-32) *nest & claim amended*

a means for displaying data (screen 32, column 8, lines 12-14)

a processor situated within the electronic housing (computer processor 30, column 8, lines 1-3)

However, Genest et al. fails to teach bottom surface of the electronic housing being securedly attached to the bottom surface of the keyboard portion . Note that Genest et al. does teach a hinge structure 17 (column 7, lines 15-16); this would allow pivoting. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Genest et al. then make use of the hinge for pivoting resulting in bottom surface of the electronic housing attached to the bottom surface of the keyboard portion to obtain the apparatus Genest et al. modified because it would allow different configurations for user. 3

As to claim 9, the device recited in claim 7, wherein the display means further comprises: a display area defined by a top edge, bottom edge, and a pair of side edges (Genest et al., screen 32, column 8, lines 3-4) ; a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and each edge of the display lying adjacent to and being securely attached to each corresponding strip of the display area (inherent on front side 26 shown on figure 1, for supporting LCD screen 32).

As to claim 10, the device recited in claim 7 wherein the display area is a Liquid Crystal Display (Genest et al., column 8, lines 13-14).

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As to claim 11, the device recited in claim 9, wherein the bottom strip and each side strip of the front panel further comprises a plurality of additional alphanumeric keys (Genest et al., keys 58 and switches 56, column 11, lines 7-8) each adapted to generate a character signal upon depression thereof; and a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor (data port and data connector, column 11, lines 13-15) .

As to claim 12, the device recited in claim 7, further comprising a pressure sensitive writing means for allowing data to be inputted via handwriting (Genest et al., column 8, lines 15-17 column 11, lines 58-64).

Claims 13, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genest et al. (US Patent 6,480,377) in view of Allgeyer et al. (US Patent 6,477,042)

As to claim 13, Genesis et al. teaches a handheld computerized device (handheld computer 12 shown in figure 1, column 7, lines 50-54) comprising:

a keyboard portion having a support base and a keypad (keyboard 20 and support base shown in figure 1, column 7, lines 34-36) plurality of individual keys 58 shown in figure 3),

an electronic housing having a configuration defined by a top surface, a bottom surface, a rear edge, a front edge, and a pair of side edges (housing of handheld computer 12 shown in figure 1)

a pair of hand support means (latch hook 60 and hook receiving member 62, column 14, lines 28-32)

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a means for displaying data (screen 32, column 8, lines 12-14)

a processor situated within the electronic housing (computer processor 30, column 8, lines 1-3)

However, Genest et al. fails to teach sliding brackets having a pair of guide members. Allgeyer et al. teaches a sliding bracket with rails (column 11, lines 55-57). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Genest et al. then make use of sliding brackets with guide members as taught by Allgeyer to obtain the apparatus Genest et al. modified by Allgeyer et al. because it would allow ease of assembling/disassembling , as taught by Allgeyer (column 11, lines 56-57) and also user can easily change configuration.

As to claim 15, the device recited in claim 13, wherein the display means further comprises: a display area defined by a top edge, bottom edge, and a pair of side edges (Genest et al., screen 32, column 8, lines 3-4) ; a front panel surrounding the display area and being defined by a top strip, a bottom strip, and a pair of side strips; and each edge of the display lying adjacent to and being securely attached to each corresponding strip of the display area (inherent on front side 26 shown on figure 1, for supporting LCD screen 32).

As to claim 16, the device recited in claim 15 wherein the display area is a Liquid Crystal Display (Genest et al., column 8, lines 13-14).

As to claim 17, the device recited in claim 15, wherein the bottom strip and each side strip of the front panel further comprises a plurality of additional alphanumeric keys (Genest et al., keys

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58 and switches 56, column 11, lines 7-8) each adapted to generate a character signal upon depression thereof, and a means for electrically connecting the plurality of additional alphanumeric keys to the processor whereby each generated character signal is transmitted to the processor (data port and data connector, column 11, lines 13-15) .

As to claim 18, the device recited in claim 13, further comprising a pressure sensitive writing means for allowing data to be inputted via handwriting (Genest et al., counn 8, lines 15-17 column 11, lines 58-64).

Allowable Subject Matter

4. Claims 2, 8 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. *what about other limitations*

The following is a statement of reasons for the indication of allowable subject matter: As to claims 2, 8 and 14, none of prior art teaches the first section of a keypad arranged in the standard QWERTY keyboard for the left hand, the second section of the keypad being arranged in the standard QWERTY keyboard format for the right hand.

CONCLUSION

5. The prior art made of record not relied upon is pertinent to applicant's disclosure

US Patent Susel 6,111,527

US Patent Tzeng 6,431,776

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the Technology Center 2600 Customer Service whose telephone number is
(703) 306-0377.

May 16th, 2003



FRANCIS N NGUYEN
Examiner
Art Unit 2674

Exh. b-16

Office Action Summary

Application No.

09/940,210

Applicant(s)

LEE, SANG MIN

Examiner

DUC Q. DINH

Art Unit

2674

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

*pull Ni
*(6,297,752)

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This is response to the Amendment filed on March 23, 2005.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amended claim 13 recites the limitation "in the closed state, the side edges of the support base are adapted to slide into the guide members such that the keypad faces the top surfaces of the electronic housing". Although the specification page 9-10 does mention the arrangement of the electronic device, there is no support in the specification for the quoted limitation above. The examiner examines the application based on best understood of the claimed language.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandenburg et al. (U. S. Patent No. 6,665,173), hereinafter Brandenburg.

In reference to claim 1, Brandenburg discloses in Fig. 6 a handheld computer comprising: keyboard portion 807 having support base and a thumbboard 805 (corresponding to the keyboard) defined by a top surface, a bottom surface, a rear edge, a front edge and a pair of side edges, the thumb board overlaying the top surface of the support base as claimed. An electronic housing 801 having the same structure with the keyboard portion as shown in Fig. 6A. Fig. 6B shows the coupling structure of the keyboard portion and the display portion in an open or closed position such that the bottom surface of the electronic housing is parallel to the bottom surface of the support base as claimed (col. 11, lines 35-53). The device specifically comprising (1) an alphanumeric data input device, such as a full QWERTY-type keyboard or thumb board; (2) a display device, such as an LCD, LED... display screen; (3) a processor; (4) a power source... and (6) a physical housing that contains these components (corresponding to the electronic housing) and that consists of at least two discrete portions that may translate, rotate and/or pivot relative to one another, one portion containing a display device and one portion containing a keyboard (col. 7 line 60 – col. 8 line 5). Fig. 7D show a keyboard having first and second section having plurality of key and being in the form of complementary symmetrical and vertically parallel with the top surface of the keyboard portion.

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Response

In addition, Brandenburg discloses that the system also has a plurality of raised grips 621 (corresponding to the hand support means) may be integrated into protective bumpers 619 to facilitate handling of and interaction with device 601. However, Brandenburg does not disclose the raised grips being attached to a side edge of the display portion of the device. Fig. 5 shows

and touch pad on the backside of the device. The touch pad is located such that it can be utilized by the user while the device is in either closed state or open state (col. 11, lines 16-34)

It would have been obvious for one of ordinary skill in the art at the time of the invention was made to provide the grips of the system to provide the user hand support while using the touchpad in the back of the display as shown in Fig. 5B or holding the device while typing on the keyboard as shown in Fig. 4.

In reference to claim 2, Fig. 7 shows the appropriate standard QWERTY keyboard format on the left and right hand as claimed.

In reference to claims 3, and 21, Fig. 6 A and 6C show the strips surrounding the display which carries the additional input device such as joystick for the system as claimed.

In reference to claims 4 and 22, see the rejection of claim 1 for the LCD display as claimed.

In reference to claims 19 and 20, refer to the rejection as applied to claim 1.

6. Claims 7-10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blandenbergh in view of Ni (U. S. Patent No. 6,297,752).

In reference to claim 7, refer to the rejection as applied to claim 1. However, Blandenbergh does not disclose, the bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard in an operable position. Ni discloses a backside keyboard for a notebook having bottom surface of the electronic housing being securely attached to the bottom surface of the keyboard as claimed.

It would have been obvious for one of ordinary skill in the art at the time of the invention
was made to learn the teaching of Ni, i.e., the bottom surface of the electronic housing being
securely attached to the bottom surface of the keyboard in an operable position, so that the user
has the same feel of location that occurs when the keyboard is on the top surface of the chassis
thereby eliminating the strain caused by twisting the wrist to type in the state of the art (col. 2,
lines 5-8).

In reference to claims 8-9, refer to the rejection as applied to claims 1-3.

In reference to claim 10, refer to the rejection as applied to claim 4.

In reference to claims 13 and 14, refer to the rejection of claim 1. In addition, Fig. 1-3
show an embodiment in which the keyboard portion and the display portion connected by sliding
means which comprising bracket and guiding members for the system as claimed (see col. 9,
lines 25-45). In addition, Ni shows the bottom surface of the keyboard and the bottom surface of
the electronic housing are parallel to each other.

In reference to claim 15, refer to the rejection as applied to claim 3.

7. Claims 5, 11, 17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over
Blandenberg and Ni in view of Makala et al. (U. S. Patent No. 6,047,196).

In reference to claims 5, 11, 17 and 23, Blandenburg discloses in Fig. 4, plurality of input
devices is provided in the boundary strips around the display device. For examples one boundary
may be indicated by a "-" sign and the opposing end boundary may be indicated by a "+" sign
(col. 10, lines 26-60). However, Blandenburg does not disclose the plurality of additional